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Transportation

The Monthly Magazine of the Transportation Industries

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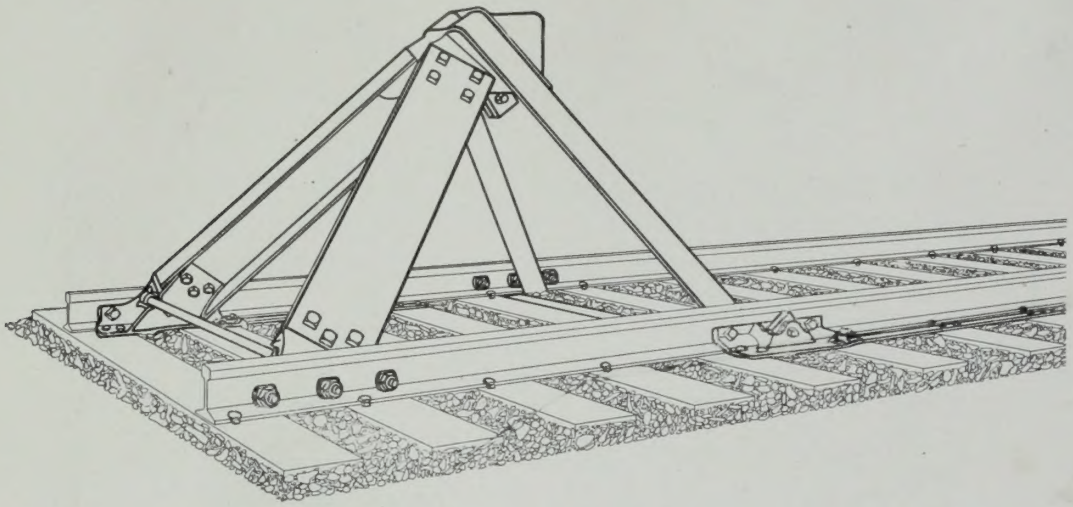
VOL. I MAY, 1927 No. 1

Differences galore



Every little while we get a letter in which the writer says he cannot see the difference between our bumping post and others; they all look about alike and one must be just as good as another.

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8. How is the shock carried to the earth?

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Yes, Type W is like other posts in having the head between the rails and coupler height, but there the similarity ends.

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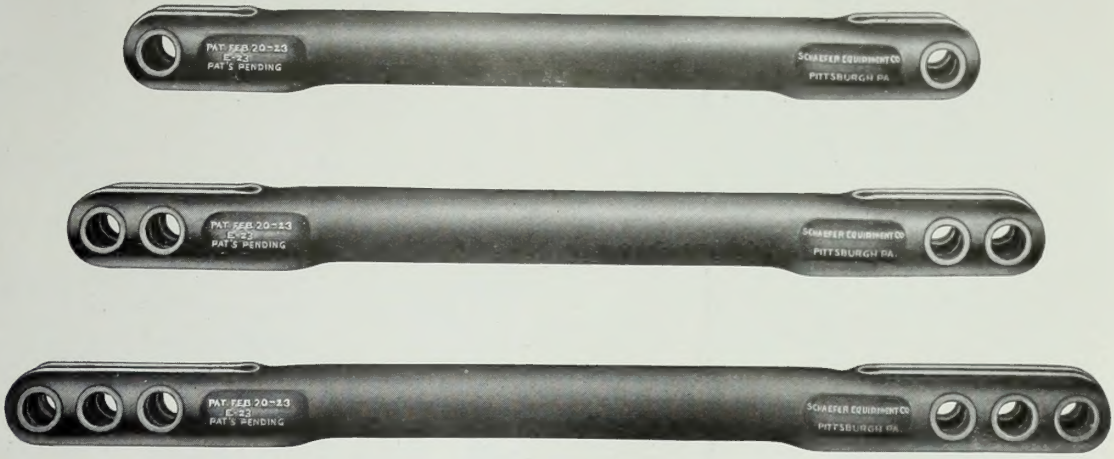

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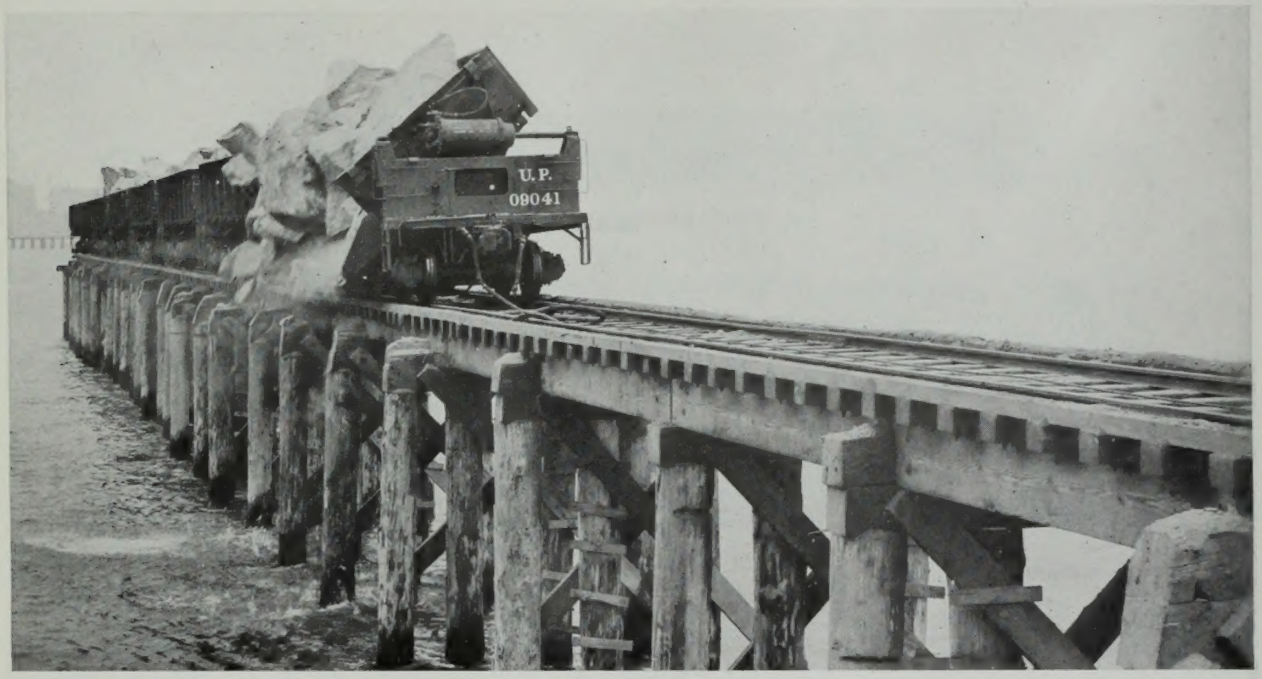

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Extension Side Dump Cars are so constructed that the load and moving parts of the car are in balance throughout the dumping operation.

It is this principle that enables these cars to furnish the best service possible in handling large rocks that are used in breakwater construction at Long Beach, California.

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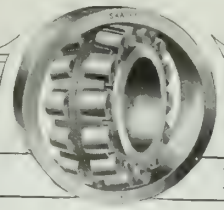

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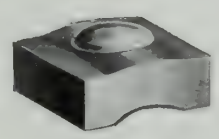
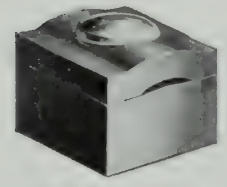
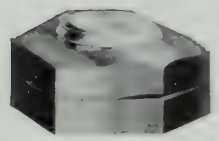


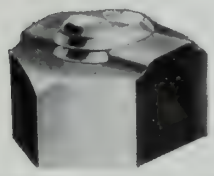
Grip Holding Nut



Grip Lock Nut



Hot Forged Grip Nut



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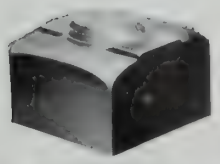
Grip Nuts



Square Grip Unit Nut

GRIP NUT COMPANY

5917 S. Western Avenue
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Transportation

The Monthly Magazine of the Transportation Industries

MAY, 1927

VOLUME ONE NUMBER ONE

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Meetings This Month

NOT a great many meetings, in addition to the regular monthly gatherings of railroad clubs, are scheduled for May. One of the specially important occasions included in this short list, is the annual meeting of the International Railway Fuel Association, May 10-13, at the Palmer house, Chicago. L. G. Plant, 80 East Jackson boulevard, that city, is secretary. An especially interesting program for this convention will be found elsewhere in this magazine.

Another important event of particular value in an educational way will be the exhibit of the Air Brake Appliance Association to be shown at the Mayflower hotel, Washington, when the Air Brake Association meets there May 24-27. T. L Burton, 165 Broadway, New York, is secretary of the last named organization.

W. J. Farrell, secretary, 30 Vesey street, New York, announces the next meeting of Division VI, purchases and stores, A. R A., to take place May 24-26, at the Palmer house, Chicago.

The railroad clubs will hold their regular meetings. Most of these organizations will adjourn for the summer after the May gatherings, resuming their activities in late September or October according to the region and its climate.

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Drills, Wood-Boring, Pneumatic
Drills, Coal, Electric
Drills, Hammer, Electric
Drills, Electric, Portable Alternating Current
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Drilling Stands, Electric Drill
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Grinders, Portable, Electric
Grinders, Precision, Electric
Grinders, Tool-Post, Electric
Grinders, Portable, Pneumatic

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Hammers, Riveting, Pneumatic
Hammers, Scaling, Pneumatic
Hammers, Stone, Pneumatic
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The West and Its Transportation

Economic Importance to the Nation

By Julius H. Parmelee

Director, Bureau of Railway Economics

WEST of the Mississippi development is attributable mainly to the efforts of pioneers who were willing to face the hardships of frontier life, in order that the natural resources of that great section might be exploited. Hand in hand with the westward movement went the expansion and improvement of agriculture and, above all, the development of improved means of transportation and communication.

Today, the West has developed into a territory of vital importance to the national welfare. The agricultural, animal and forest products of this section feed and house a large part of the inhabitants of the United States. Five out of every six bushels of wheat, three out of every four bushels of oats, two out of every three bushels of corn, and three out of every five feet of lumber produced in the United States come from the states west of the Mississippi. Besides these, there are the great apple orchards of the northwest, the citrus fruit and grape crops, and the cattle raising industry of the southwest, not to mention many other agricultural and mineral products.

A survey of statistics of revenue freight tonnage readily discloses the importance of the so-called extractive industries in the West. During 1925 railways in that district accounted for 35 per cent of the revenue tons originating in the United States. Products of agriculture originating in the western district were 65 per cent of the total for the United States, animals and animal products 70 per cent and products of forests 58 per cent. Products of mines represented 29 per cent.

Organization and cooperation hold the modern stage. This is true in regard to transportation, and particularly so in the western district. The commercial and industrial activities of that district could not long exist without the lines of communication that bind them to the consuming cities of the East, and give them access to markets across the seven seas.

This area had an estimated population of 41,000,000 in 1925, which represented 35.6 per cent of the population of the entire United States. In 1900, the population of 25,500,000 was equivalent to 33.5 per cent of the total population. During the twenty-five year period, therefore, the population of the western district increased 61 per cent, compared with 47 per cent for the remainder of the United States. The greater part of this increase fell in the Mountain-Pacific area — that territory west of a line following the western boundary of North Dakota and South Dakota to Cheyenne, thence through Denver, and Las Vegas, N. M., to El Paso. The population of this section more than doubled, due largely to the remarkable growth of the three Pacific Coast states.

Railroad mileage during the same quarter century since 1900 increased by 36 per cent in the western district, compared with 32½ per cent in the East and South.

During this period of twenty-five years in which population grew more than one-half, railway service grew relatively much faster. Passenger - miles more than doubled, while the revenue ton-miles nearly trebled. This indicates that the railways of the West have kept pace with, indeed, have kept ahead of the growth of the population, and have maintained their transportation service at a level to meet the increasing standard of living. For it is this higher

So Far As Known This Was the Only Time Anyone Ever Caught Doctor Parmelee With His Eyes Closed. But It Happened in London Where He Presided Over the Deliberations of Section IV, General, in the International Railway Congress, in 1925. It Was a Warm Day, and Someone Had Just Made a Speech.

standard that has led to the increasing demand on the western railroads for service, which has risen from 229 passenger miles per capita in 1900 to 293 in 1925, and from 1940 ton-miles per capita in 1900 to 3503 in 1925.

In 1925 the western carriers, operating in a territory several times as large as the eastern and southern districts combined, and containing 35.6 per cent of the population of the United States, handled 33.3 per cent of the total passenger-miles, 34.5 per cent of the revenue ton-miles, and 35.2 per cent of the revenue tonnage.

If ever there was a land of magnificent distances, it is that part of the United States west of the Mississippi. Only one economic factor can conquer distance, and that is the transportation factor. Although modern transportation takes many forms, by land, water, or air, and land transportation utilizes either highways or railways, to date the one element of transportation that stands out above all other elements is the steam railway. Whatever may be the developments of the far distant future, it seems likely that for many years to come the steam roads will be the great factor of transportation, especially in the handling of freight over long distances.

During the year 1926 the railways of that district, like those of the other districts, broke all records for the transportation of freight traffic. Compared with 1925, and with the previous peak year of 1923, the number of cars loaded with revenue freight during the year was as follows:

1926	19,095,803
1925	18 671,019
1923	18,039,591

The increase over 1925 was 424,784 cars, or 2.3 per cent, while the increase over 1923 was 5.9 per cent. All of the principal commodity groups, except live stock and forest products, showed increases from 1925 to 1926, as follows:

Revenue Freight Car Loadings By Commodities, Western District

	1926	1925	% Increase in 1926
Grain Products	1,498,622	1,473,196	1.7
Live stock	1,227,958	1,245,341	d. 1.4
Coal	1,504,903	1,487 330	1.2
Coke	112,413	98,598	1.4
Forest products	1,985,373	1 994,861	d. 0.5
Ore	1,467,617	1,333,973	10.0
Mdse. L. C. L.	4,371,549	4,304,354	1.6
Miscellaneous	6,927,368	6,733,366	2.9
Total	19,095 803	18,671,019	2.3

The passenger business did not fare quite so well. Estimating the returns for the year on the basis of those for the first ten months, it appears that there was a loss in 1926 of four per cent in passenger-miles, compared with the returns for 1925.

As to revenues and expenses, the following estimate of the income account of the western carriers in 1926, compared with 1925, will be of interest:

	1926	1925
Operating revenues	$2,350,000,000	$2,283,000,000
Operating expenses	1,681,000,000	1,674,000,000
Taxes	159,000,000	149,000 000
Net Ry. operating income	463,000,000	415,000,000

Net operating income is what is left of the revenue, after the payment of all expenses of operation, taxes, and rentals for the use of equipment and local facilities. Out of the net operating income must come the fixed charges, and all appropriations for dividends and surplus.

The net operating income of $463,000,000 for 1926 was below what it should be to produce an adequate return on the investment. Comparing this net income with the investment at the beginning of 1926, including materials and supplies and cash, the rate earned on that investment, during 1926, was 4.52 per cent. This was an improvement over any previous year since 1917, but there is much additional room for improvement.

From 1921 to 1926, there has been an almost steady, though slow, rise in the rate of return in the western district, as follows:

1921	3.08 per cent
1922	3.47 per cent
1923	3 96 per cent
1924	3.87 per cent
1925	4.13 per cent
1926	4.25 per cent

The over-all average for the six years as a whole was 3.83 per cent. An average return of less than 4 per cent on the property investment of an industry, over a six-year period, is clearly too low a return to the investors in that industry, and is in fact lower than it should be to maintain credit and assure future progress.

This is not the place to discuss a solution of the problem. It was shown at hearings before the Interstate Commerce Commission in the recent general rate case in that district, that the railways had fully kept pace with the other districts in their progress toward greater efficiency and economy of operation during recent years. Whether the savings thus far made in operating costs, because of increased efficiency and economy, can be continued indefinitely, is an open question. But the railway rate of return in the district should be increased, and that appears to be the vital economic problem confronting the carriers of the territory west of the Mississippi River.

There have been four great financial depressions in this country; one in 1837, one in 1857, one in 1873 and one in 1893. Prof. Ellisworth Huntington of Yale says that each has followed a period of deficient rainfall and bad crops.

Humility is a characteristic of a first rate man; and egotism that of a second rate man.

Will Jim Hill's Dream Come True?

The Latest Big Merger Proposed

By Ralph Budd

TWENTY-FIVE years ago James J. Hill proposed to consolidate the Great Northern, Northern Pacific and Burlington and their subsidiary companies into one railway system. The courts then held that such consolidation was prohibited because the Anti-Trust Act of 1890 was construed to mean that there could be no consolidation of railroads where there was substantial competition. That law, according to the interpretation then adopted, left no room for any inquiry whether the consolidation might be in the public interest when viewed from all standpoints. The law at that time proceeded on the mistaken theory that unbridled competition was of paramount importance in giving the public good, ample, and cheap railroad service.

Changes in public opinion and in congressional policy, and the development of very effective railway regulation, together with the building of other railways in the territory, have entirely altered the situation. The Transportation Act 1920 provides that the Interstate Commerce Commission "shall as soon as practicable prepare and adopt a plan for the consolidation of the railway properties of the continental United States into a limited number of systems." To serve as a basis for discussion, the commission made a tentative plan which put the Great Northern and Northern Pacific in different systems, grouping the Great Northern with the Chicago, Milwaukee & St. Paul, and the Northern Pacific with the Burlington. The Great Northern, Northern Pacific, and Burlington all joined in urging the commission to put them in a single system. The commission reached no decision on this, since it concluded that the plan for general consolidation of the railroads throughout the country could not be immediately prepared and that additional legislation was desirable. As a result, consolidation in the strict sense has not yet become practicable as contemplated in the Transportation Act.

Ralph Budd, President of the Great Northern Railway Co.

On the other hand, the Transportation Act has provided for acquisition of control of one carrier by another through stock ownership and lease without complete consolidation, and the Interstate Commerce Commission has sanctioned extensive unifications by stock control and lease. This is what is now proposed by the two northern companies, and such unification can only be lawful and effective if the commission finds it to be in the public interest.

25 YEARS AGO

JANUARY 24, 1902.

CHICAGO.—E. H. Harriman and James J. Hill are on their way to Chicago and will arrive today to answer subpoenas from the interstate commerce commission. It is believed that Mr. Harriman and Mr. Hill will defend the recent railroad consolidation. —Chicago Tribune, Jan. 24, 1927.

The proposal is, in addition to control through stock ownership, to lease the lines of the northern companies to a single operating carrier, which it is contemplated will also directly operate the Spokane, Portland & Seattle Ry. Co. —a property already jointly controlled through stock ownership.

The operation of the Burlington, which is also controlled by the northern companies through equal ownership of over 97 per cent of the stock, will remain separate as at present. But the vesting in a single control of the entire 97 per cent of the Burlington stock, now owned separately and in equal shares by the northern companies, will better unify the direction of the Burlington and will be favorable to the more decisive handling of its development policies than has been practicable when each northern company voted separately and independently its half of the Burlington stock.

The unification we are proposing is not to be viewed as an original and independent move which has never been started upon and which, therefore, need not now be entered upon at all. The fact is that over twenty-five years ago the two northern companies took an extremely important step in this direction by acquiring control of the Burlington through purchase of a large majority of the Burlington stock. Ever since that time the two northern companies have been committed to an important common undertaking, involving hundreds of millions of dollars. They are already tied together by this community interest, and it is one which in a practical sense can not now be successfully untied, because the Burlington would suffer heavily if it were dissociated from either one of the northern lines, since for over a quarter of a cen-

tury it has been built up with reference to association with both of them. A similar community of interest has existed for a great many years on account of the equal ownership by the northern companies of the S. P. & S., which represents a total investment of more than $100,000,000. These are great facts which cannot be ignored.

When these things were done, they constituted important forward steps in the rendition of better and cheaper service in the West. These steps cannot be retraced. Under the wise policy which congress has now adopted as to further railroad consolidation, the next logical step should be taken, and that is to unify the control and the operation of the two northern companies whose interests are already so tied together that they cannot be untied. What has been done has been a great help to the public. The further step which is now proposed will be of great additional public benefit.

In the Middle West and Northwest, where the population depends almost wholly on rail transportation and where, by reason of the great distance from markets and the relative disadvantage to which the Panama Canal has placed the territory compared with the regions nearer the seaboard, the matter of railway rates has received much public attention.

That railway rates have been increased less in this region than for the average of the United States, and very much less than the increases which the railways must pay for the things that enter into the cost of producing transportation, is sometimes overlooked. The fact is that compared with ten years ago the average rate per ton mile in the northwest region is only 40 per cent more, while for the United States as a whole it is 50 per cent more and for some regions 60 per cent more, notwithstanding the further fact that wages have increased 100 per cent, taxes have increased 110 per cent, and the average cost of all commodities 60 per cent during the same period. The result of this lesser increase in rates in the Northwest has been that the average return earned by the carriers in this region is less than the average for the United States and is far below the statutory return of 5¾ per cent fixed by the Interstate Commerce Commission as being fair, having averaged only 3 per cent for the six years since federal control.

The bearing which these facts have upon the present question is that it would be greatly in the public interest if a way could be found to improve the earnings of the northwest railways without increasing rates and without impairing the service rendered. As the present basis for rate making is the cost of producing transportation, the only way in which low rates may be maintained is through efficient and economical operation of the railways, and the public is vitally interested in all economies that the railways can make.

The railways of the Northwest have in every way endeavored to increase their efficiency and improve their service; to these ends they have made very large capital expenditures for more and better facilities, and have enlisted the cooperation of their employes and the public, with the result that the service now rendered is better than ever before. As I have already stated, it is being provided at a cost relatively much lower than railway charges in other parts of the United States and without adequate return to the carriers.

Now, there is a distinct limitation to further economies through increased efficiency and improvements to the existing properties, but it is believed that the economies which will result from the unified operation of the Great Northern, Northern Pacific, and S. P. & S., and an even closer association with the Burlington than has hitherto existed, are certain to be large and that important improvement to service also will result.

The facts that there are many points of contact between these roads; that while occupying different territories there are alternate lines between several points; and that the wide geographical spread of territory conduces to better average use of equipment, all lend themselves to a plan for saving in operating expenses and at the same time performing more service with the present railroad facilities. A great deal already has been accomplished along these lines during the last twenty-five years.

The Great Northern and Northern Pacific have avoided the building of duplicate lines and terminals by making joint use of lines and terminals. To that extent, savings by joint use and by avoiding unnecessary construction of separate lines have already been made. Also each of the northern lines uses jointly with the Burlington and with the Spokane, Portland & Seattle, certain facilities and each does some switching for the other, for the Burlington, and for the Spokane, Portland & Seattle. The purchase of the Burlington by the two northern lines is the greatest example of avoidance of duplicate construction; another example is the joint construction of the Spokane, Portland & Seattle and subsidiaries at a cost of more than $100,000,000. Examples of joint use of track which have avoided construction are between Seattle and Portland, 182 miles; three stretches of track between Seattle and Vancouver, B. C., 72 miles; between Huntley and Fromberg, through Billings, 50 miles; between St. Cloud and St. Paul, 76 miles. There is now practically no duplication of terminals as between the Burlington and the northern lines at their points of contact; namely, Twin Cities, Sioux City, and Billings. To a large extent, therefore, savings by joint use of tracks and terminals and by the avoidance of unnecessary capital expenditures have already been made, but in some instances the two northern lines are

Serving Four O'Clock Tea in the Observation Car of the Oriental Limited, Great Northern Ry.

now operating duplicate terminals and duplicate train service, and in those instances further economies can be made.

A saving could also be brought about by avoiding the necessity of performing some terminal work; for example, a car coming into a terminal from the Great Northern line and destined to an industry on the Northern Pacific, after being emptied, could be loaded out again without any necessity for the car being returned to the Great Northern as at present. Likewise, the expense of joint inspection would be saved. Another way that work could be avoided would be by routing the freight into a terminal via the line upon which the industry to which it is destined is located. Elimination of delay to cars incident to switching and joint inspection, which would be accomplished by single operation, is important both from the standpoint of economy and improved service.

One of the essentials for the success of private operation of railroads is that the railroads shall have such credit as will enable them to provide for the necessary extensions to care for new territory and for enlarging and improving existing lines to care for increasing business. More intensive use of existing facilities will help in caring for increased business, but stabilized credit is essential to meet the growing needs of a growing country. Especially is this true in the West where considerable additional new mileage should be built. To serve a new and growing territory where branch lines must of necessity be built and operated without profit for a considerable period, the strength shown by this system is none too great.

I wish to emphasize particularly that the proposed unified operation would distinctly promote the public service.

Service would be improved by eliminating terminal delays at transfer points and by getting a better distribution of cars throughout the year, thus making available a larger number of cars for the seasonal movement of crops which mature at widely separated dates in the enlarged territory; by consolidated offices and tariffs; by avoiding switching and the charges incident thereto at points common to any of the lines; and by automatically making every industry now on the Great Northern, Northern Pacific, or Spokane, Portland & Seattle an industry on the combined system. To a very large extent, industries common to the Burlington and either one or both of the northern lines would benefit likewise.

The unified operation of the Great Northern, Northern Pacific, and Spokane, Portland & Seattle and the resulting closer cooperation with the Burlington not only would result in important economies and improvement in service, but would in addition accomplish another requirement that is very important in the public interest; namely, that of preserving existing routes and channels of trade. The relationship between these lines has resulted in railway and industrial development which anticipated the continuation of that relationship and the establishment of closer bonds, which the present plan will to a large extent accomplish.

Producers of all kinds of manufactured goods, including implements and machinery for the farms, mines, and mills of the Northwest, as well as large jobbing and merchandise houses which are served by the Burlington have distributing offices, and warehouses located on both of the northern lines, while the Burlington terri-

Tea Wasn't Served in This Observation Car Crossing the Plains. Coffee and Sidement Were Delicacies.

tory consumes large quantities of lumber, grain, livestock, fruit, fish, and other western products which originate on the two northern lines and the Spokane, Portland & Seattle. The large volume of traffic which moves both east and west through the interchange points at the Twin Cities, Sioux City, and Billings, indicates the importance of the trade routes that have become established. These railway companies, as well as shippers and consumers, have every reason to desire and to expect that such important routes will be maintained and improved.

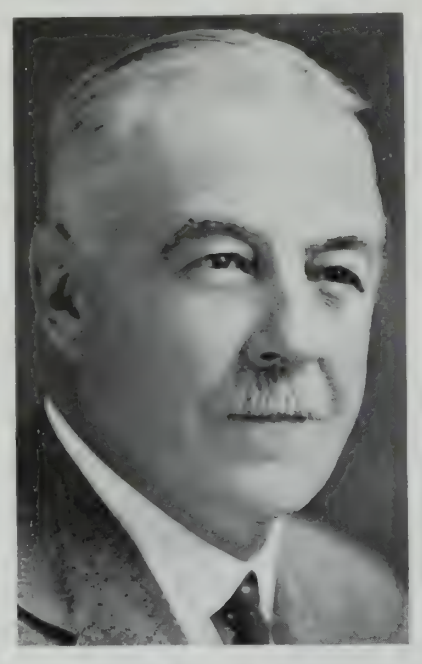
As I said at the beginning there was a time when unbridled competition was relied upon to obtain low railway rates and ample railway service. Experience has shown that the evils resulting from excessive competition were so great in the matter of rates that the fixing of rates now is vested entirely with the Interstate Commerce Commission. To a large extent it is also true that a reasonable amount of competition with respect of service will accomplish as much as excessive competition, which tends to extravagance.

By the tests of saving in operating costs, strength necessary for expansion, improvement of service, preserving existing routes and channels of trade, and preserving competition, the single operation of the Great Northern, Northern Pacific, and Spokane, Portland & Seattle roads as one system seems to be justified.

Campaign for Heavier Loads

Plans for a general campaign to bring about the loading of freight cars more nearly to capacity were made at a meeting in April of the transportation division of the American Railway Association at the Ambassador Hotel in Atlantic City. Recommendations of the committee on car service were adopted requiring all railroads to file monthly with the car service division a report showing the average weight of car loadings for various commodities. The importance of capacity loading is illustrated by the fact that an increase of one ton in the average car load produces the same transportation as would be produced by adding 80,000 cars without any increase in capital expenditures.

Increasing competition due to the development of other forms of transportation as well as increasing operating costs growing out of higher wages and taxes, makes it necessary to bring about a continuing progressive betterment of the service afforded the public by the steam roads if they are to continue to furnish adequate transportation, R. H. Aishton, president of the American Railway Association, told the meeting.



R. H. Aishton.

"The whole future of railroad transportation," Mr. Aishton said, "depends on a constantly increasing betterment in service, with constantly increasing efficiency and economy in operation. A new high mark was set in 1926 in the history of the railroads. Not only did they carry without car shortage or transportation difficulties the greatest freight traffic in their history, but they also handled this traffic with the greatest expedition ever achieved.

"There is a growing need, however, for obtaining greater service out of every freight car. The railroads have brought about the faster handling of freight by increased efficiency in the operation of terminals and the movement of trains with the result that in 1926 the average daily movement of cars was 30.4 miles, the highest average for any year ever reported.

"There is a necessity, however, for the loading of freight cars more nearly to capacity. In order to accomplish this, more intensive cooperation is necessary between the railroads on one hand and the shippers as well as receivers of freight on the other. The average car load for all commodities in 1926 was 27.4 tons. Had there been an increase of one ton in the average load the same transportation would have been produced by 80,000 fewer cars than actually were used. Figuring the cost of a freight car at approximately $1800, this would have meant a saving of about 144 million dollars in the capital investment of the railroads. But this saving is small compared to the saving that will accrue to the shipping public from the heavier loading of freight cars, particularly when the freight traffic is heavy and the demand for transportation facilities is greatest."

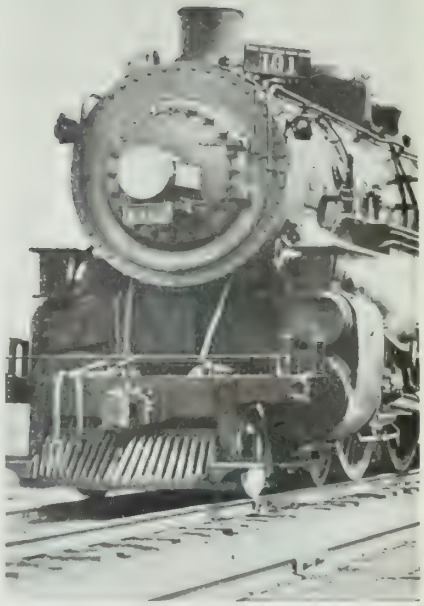
The World Do Move

Excerpts from the diary of Joseph Sill, reproduced by the Philadelphia Public Ledger, include this delightful description of a day's railroad journey in June, 1841:

"So that in 13 hours we had traveled 60 miles into the country — remained there nearly six hours, and returned again 60 miles, making in all 120 miles during the day light of one day! And had passed the time pleasantly and without much fatigue."

Heavier Trains, Longer Runs, Lower Costs

The Trend in Locomotive Design



THE steam locomotive is passing through an epochal period. New constructions are marked by a concentrated effort on the part of designers and builders to produce a high capacity, efficient motive power unit. In this they are encouraged by the railroad operating officials and forces who, during the last year, established railroad records of more than statistical interest because they have influenced vitally the prosperity and the economic situation throughout the United States.

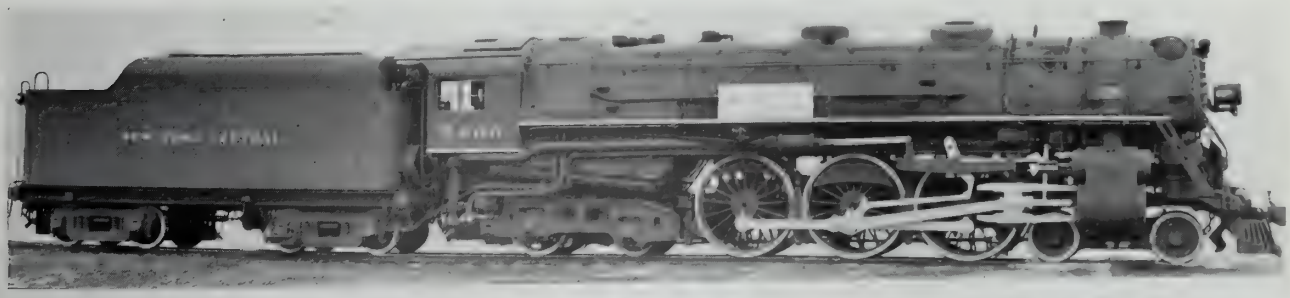
Mass production, manufacturing efficiency, wide distribution of commodities and dependable transportation are factors in the present prosperity. The locomotive has been called upon to haul heavier trains at higher speeds and lower costs, on longer runs and with greater dependability than at any time. These requirements may be expressed in the trend of locomotive design as high sustained capacity fuel economy, the ability to withstand the severe service requirements of long runs, and to perform this service without undue wear and tear on the permanent way and supporting structures.

Weight and dimensional limits imposed by the permanent structures of the railroads, bridge and tunnel clearances and the disposition of multiple tracks have always in the past, and will continue in the future to restrict the increase of the locomotive in cross-sectional dimensions and the weight on each axle. The solution of the problem of building a bigger locomotive than any one else has been solved in one way by the Union Pacific for which the American Locomotive Co. has built 15 three-cylinder simple, non-articulated locomotives with six pairs of coupled drivers. This class of locomotive is known as the Union Pacific type and is designated as of the 4-12-2 class on account of having a four wheeled leading and two-wheeled trailer.

Not only is this the largest non-articulated locomotive ever built, but it is capable of producing 80,000 ton miles per hour as compared with 13,500 twenty-three years ago for the heaviest engine on the same division, and 19,679 for all locomotives on Class 1 railroads in 1925.

The increase in sustained capacity of locomotives has been much greater than in total weight and tractive effort. This has been accomplished principally by providing greater boiler capacity by means of larger fireboxes, more grate area, higher superheat, higher pressure, and by the use of the limited cut-off or the three cylinder arrangement.

The tendency to use higher steam pressures has been influenced somewhat by the development of water tube boilers. During the year the New York, New Haven & Hartford installed three Mountain type locomotives equipped with water tube boilers of the McClellon type operating at 265 lbs.



The New Hudson Type Built for the New York Central by the American Locomotive Co. to Pull the Twentieth Century Limited.

steam pressure. Three boilers of similar construction were in operation previously, making a total of six boilers of that type on the New Haven. The success of the Delaware & Hudson locomotive, Horatio Allen, operating with a water tube boiler at 350 lbs. has led to the construction of a similar locomotive, the John B. Jervis, with 400 lbs. working pressure.

This locomotive was delivered to the Delaware & Hudson in January, 1927, and placed in freight service. It may be briefly described as a cross compound consolidation locomotive with one 22½ and 38½ by 30 inch cylinders, water tube boiler operating at 400 pounds pressure. The drivers are 57 inches in diameter and the tractive effort simple 84,300 pounds, compound 70,300, six wheel tender type booster 18,000 pounds. The most significant figure of comparison between the Horatio Allen and the John B. Jervis is the reduction of the weight per cylinder horsepower from 116 to 112 pounds.

The Baldwin Locomotive Works has built an experimental locomotive of the 4-10-2 type with a modified booster type boiler designed for a working pressure of 350 pounds. This locomotive also incorporates a three cylinder arrangement with a high expansion ratio by means of one high and two low pressure cylinders. This locomotive has been tested at Altoona and data indicate a successful design in every way.

This locomotive developed 4,500 horsepower which is the capacity of the testing plant at Altoona. The boiler has an evaporative capacity of 7,000 pounds of steam per hour with an efficiency of 52 per cent, which does not differ greatly from a well designed boiler of the conventional type. The water rate per indicated horsepower shows a variation from 14.2 at lower outputs to 15.4 at the maximum horsepower, indicating high cylinder efficiency at all loads which is the ideal of the steam engine designer.

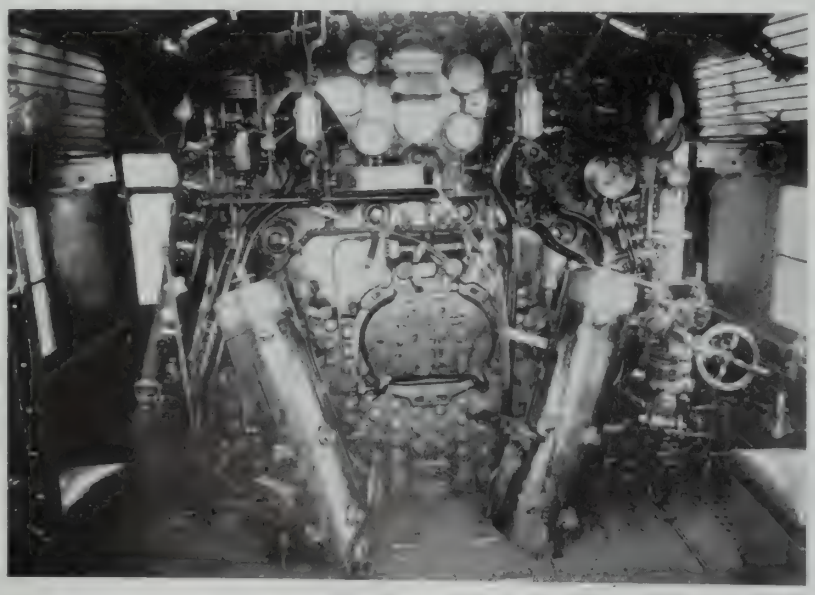
Higher sustained capacities have been accomplished by a definite trend in the basic design of locomotives, and to effect still greater fuel economy heat conserving auxiliaries are being used in increasing numbers.

The limited cut-off was introduced to effect economy in steam consumption, but to make use of more adhesive weight during the starting period the booster has been included on a large proportion of the new locomotives constructed during the past year.

Feed water heaters of various types have become the rule rather than the exception. The number of feed water heater applications has shown a steady increase for the past seven years. A new type of feed water heater introduced recently to American railroads is the Dabeg double pump mechanically driven feed water heater. Installations have been made on the Delaware & Hudson and the Kansas City Southern. This type of heater is finding extensive application in Europe, particularly in Austria, Switzerland, Greece, England and France.

The Elesco exhaust steam injector has received favorable attention, and several builders' lots of locomotives have been equipped with it. The Sellers feed water heater injector was placed on the market during the past year. All of the feed water heaters are designed to accomplish a definite economical purpose by utilizing a portion of the heat available in the exhaust steam and conserving the water supply which in many cases must be subjected to extensive treatment before it is fit to be used as boiler water.

A superheater is now a part of the standard construction of a locomotive. On account of difficulties caused by the expansion and contraction of steam contact parts such as piping, steam valves and cylinders, it has been generally agreed that 700 degrees Fahrenheit is the maximum steam temperature that will be practicable in locomotive operation. At least one well known engineer has suggested the use of poppet valves on locomotive cylinders and there is every reason to believe that the successful experience of builders using this type valve in stationery engines can be utilized to advantage in locomotive design.



In the Hudson Type Cab Arrangement Every Steam Pipe Possible to Exclude Has Been Kept Outside. Convenience is Emphasized in Placing All Fittings.

Other distinct advances in fuel economy devices in the past year have been more along the line of the wider application of existing economy devices and betterment of operation due to the utilization of these devices. Both manual and automatic cut off control based on adjusted back pressure in the exhaust passages have been found to be very valuable in the promotion of fuel economy. The introduction of the front end throttle has made possible the operation of auxiliaries such as air pumps, feed water heaters and boosters by super-heated steam, thus reducing the evaporative load on the boiler.

The power reverse gear which has also arrived at the estate of a locomotive construction standard has been found to assist in fuel conservation by permitting more accurate control of cut-off, especially when the engineman is guided by back pressure indication.

The trend in design toward larger grate areas has led to a more intensive study of grate design with the result that there is now under way a distinct development in grate construction and performance. It has been found that for certain types of coals and rates of combustion the openings in the grate can be very much restricted as compared with current designs. This has resulted in the table grate with circular openings. Successful installations have been made using such grate with holes ½ inch in diameter with a total air opening of 13 per cent of the grate area. Grates of this type were used on locomotive 1844, which made a continuous run of 1898 miles on the Northern Pacific, March 18-23, 1926.

Grate design and performance is only one of the factors entering into long runs which have been the means of better locomotive utilization. Longer runs have become so well established that the principles and practices involved are becoming stabilized. Among these practices should be noted the periodical inspection and systematic repair of locomotives, elimination of intermediate repair of locomotives, elimination of intermediate repair points, and concentration of improvements at extended district terminals. It has also been demonstrated during the year that increased mileage by means of extended runs has materially reduced the unit cost of locomotive maintenance.

Since longer runs are largely a matter of maintenance, it is self-evident that details of design which will eliminate as much maintenance as possible would be studied as of proportional importance. Cast steel tender frames have proved their value in recent years, likewise the first application of an integral cast steel frame to five Southern Pacific Mountain type locomotives, and a combination cast steel frame and cylinder to an eight-wheel switcher by the St. Louis Terminal R. R. no doubt will mark the beginning of a new era in locomotive construction. As many as thirty bolted parts and 6000 pounds in weight are eliminated by these castings which were produced by the Commonwealth Steel Co. Not only is the Southern Pacific to be credited with pioneering in the application of the integral cast steel frame, but in the same lot of locomotives that company installed a new type of front end throttle having multiple valves, the chambers of which are cast integrally with the superheater header. The extended run is also responsible, apparently, for a more intensive development of water treatment from an operating standpoint as well as to counteract the destruction due to corrosion and the fuel losses due to scaling. To avoid foaming on the rapid precipitation due to a variation in water at different points, the treatment of water to as near uniform quality as possible has awakened a new interest in water treatment. Many treating plants of high order were established in 1926.

The future of steam locomotive design can scarcely be predicted but there is a definite trend in certain directions that are well defined. Two cylinder limited cut-off locomotives are the result of the study of a certain group, the three cylinder simple and three cylinder compound arrangement of cylin-

The Delaware & Hudson's New Locomotive, "John B. Jervis," Designed by John E. Muhlfeld, and Built by the American Locomotive Co.

ders are of others, but the object is the same, namely, to increase the cylinder efficiency. Higher steam pressure can be safely predicted as the increase in boiler pressure in the past has established a definite trend of development. Just now the question of retaining the conventional radial stayed, or the Belpaire boiler is raised by the advent of the water tube boiler. Firebox volume and form will receive more attention and firebox design will involve more than grate area and heating surface.

The A. R. A. and A. R. E. A. studies of track stresses have led to a more intensive study of weight distribution, counterbalanced and tracking characteristics and we may expect better counterbalance, spring rigging design and truck development both in guiding and trailing trucks.

The demand for increased sustained capacity as measure gross ton miles per train hour and longer runs emphasizes the necessity not only for utilizing as much of the weight as possible in the boiler but greater reliability of machinery parts. There will, therefore, be an increase in the use of weight reducing material that leads directly to the use of alloy steels of definite properties. Cast steel cylinders are being used in increasing numbers for the same reason.

The more recent types of locomotives include the Union Pacific three-cylinder 4-12-2, the Northern Pacific 4-8-4, and the Hudson 4-6-4, built recently for the New York Central by the American Locomotive Co. The Hudson type designed for main line high speed service has two 25 by 28 inch cylinders, 225 pounds boiler pressure, 79 inch drivers, and has a total tractive effort with booster of 53,500 pounds.

As stated by R. Eksergian before the Oregon section of the American Society of Mechanical Engineers—

"In our improvement work we must begin by recognizing that the future locomotive will be the result of numerous refinements, the gains being in all cases small. . . . The gains obtained will not be spectacular, but rather good engineering balance and refinement."

A paragraph illustrating the trend in locomotive replacement by more powerful units is taken from the annual report of one of the more aggressive railway managements.

"Twenty-five Mountain type passenger locomotives were added. One Consolidation, five Moguls, three ten-wheel freight type, two eight-wheel passenger and eight six-wheel switchers were retired. Twenty-five locomotives were superheated. The increase in tractive power of locomotives for the year was 910,801 pounds.

"Nineteen locomotives were retired, twenty-five Mountain type locomotives installed, twenty-five were superheated, presumably without alterations affecting their tractive effort. In numbers the increase in locomotives was six, yet the increase in total tractive effort was 910,801 pounds."

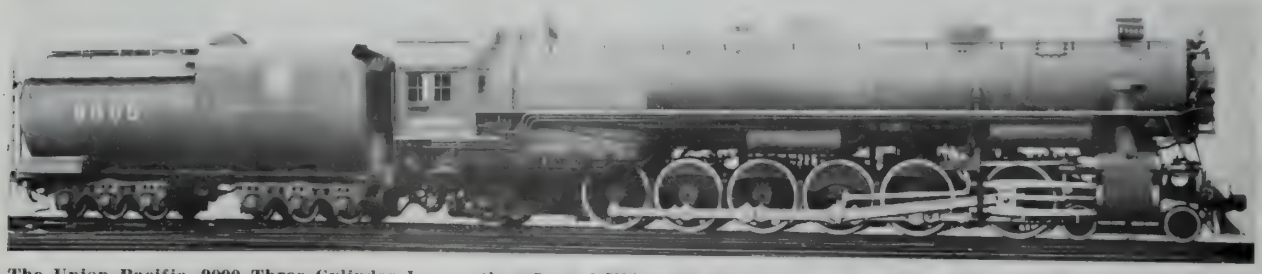
Without a doubt, the next report of the same carrier will show a similar change in keeping with the progress being made in locomotive design and utilization.

The outstanding features of the new Union Pacific 9000 Type locomotive, in addition to its size, power and speed, are: single construction upon one rigid frame; a third centrally located cylinder making possible the development of 4,330 horsepower and high speed; twin airbrake compressors on front end of the boiler; a feed water heater on left side of the boiler where the airbrake compressors usually are, and headlight and bell on front end of the boiler. The third cylinder makes the exhaust, or familiar "choo-choo" sound distinctly different.

Total weight in running order, with tender	782,000 lbs.
Total length over all, with tender (about 1/3 of a city block)	102 ft. 6½ in.
Height (approximately that of the average bungalow)	16 ft. 1½ in.
Width	11 ft. 2 in.
Grate area	108¼ square ft.
Height of driving wheels	5 ft. 7 in.
Speed	50 mi. per hr.
Tractive power	96,000 lbs.
Water carried	15,000 gallons
Fuel carried	21 tons
Coal consumed per hr., automatically stoked	between 6 and 7 tons

California ranks as the fifth heaviest lumber producing state in the nation, with an annual average cut during the last five years of approximately two billion board feet. Lumber production in the state has increased gradually over a long period, followed by exceptionally heavy cutting since 1921.

An extension of seven and one-half miles from Kingdon, Cal., will be constructed by the Western Pacific R. R., which has applied to the Interstate Commerce Commission for a permit. The line will tap agricultural lands.



The Union Pacific, 9000 Three-Cylinder Locomotive, One of Fifteen Built for That Road by the American Locomotive Co.

The President Writes to Safety Men

Chicago Meeting Hears Letter

By W. H. Harper

THE fact that 2,500 persons were killed and 7,000 injured last year in railroad crossing accidents moved the President of the United States to send a special letter discussing the situation to the annual meeting of the safety section, American Railway Association, at the Palmer house, Chicago, April 20.

Addressing his communication to Thomas H. Carrow, chairman of the safety section, President Coolidge said:

"The safety section, American Railway Association, in endeavoring to lessen the number of fatalities and injuries at railroad-highway crossings throughout our land, is occupied with an important and creditable task.

"The loss of 2492 persons, and injuries to 6991 others, in 1926 in crossing accidents demonstrates the need of more care and caution. Unquestionably the railroads must be required to give ample warning of the approach of trains to highway crossings, and throw around the highway traveler at such crossings suitable safeguards appropriate to the volume of traffic.

"With equal force there must be public recognition of the need of a very high degree of care on the part of motorists approaching and passing over railroad crossings. If that care which prudence dictates is exercised at crossings by all users of highways, then we shall surely curb the increasing tragedies. The influence of that care and prudence will also be reflected in reducing the vast number of street and highway casualties with which we are afflicted.

"It is my earnest wish that all motorists and all railroads exercise that skill, judgment and caution which assures safety at grade crossings.

"May your labors in directing attention to the hazards at crossings be rewarded with gratifying results."

The meeting was attended by more than 500 persons representing railroads throughout the United States and Canada. The sessions continued for three days. R. H. Aishton, president of the American Railway Association, welcomed the convention officially in his address Tuesday, April 19, and urged continued activity in an effort to bring about still further reductions in crossing accidents. Mr. Aishton emphasized the effect of the tremendous number of such accidents upon individuals and their families. "Had the same proportion of fatalities and injuries occurred during the period from 1921-1926 that occurred in 1920," he said, "more than 2,600 railroad men would be lying in their graves today instead of enjoying the benefits of citizenship in this great country, and 22,790 employes would have suffered injury who are whole men physically in so far as their railroad responsibility is concerned.

"We cannot remind ourselves too often that the gospel of safety we preach and practice is an inspiring and optimistic one. Safety pays in dollars. But more than that, it repays us richly for the efforts we make, and those dividends are the far more important ones of happiness and good cheer.

"The engines of peace are no less deadly than the engines of war. The casualties of peace are even more terrible than the casualties of war; for the victims of war were men, strong to endure suffering, but the victims of peace often are helpless babes in mothers' arms. Let us give the same thought and efforts toward controlling loss of life and mutilations due to injuries of peace that nations today are giving toward lessening the casualties of war.

"Three years ago you set a goal of reduction of accidents to employes to 35 per cent by 1930. In three years you have reduced these accidents 19 per cent, with four years to go. You are now in advance of your schedule and it is in your power to beat the time set by a considerable margin.

"One of the foremost problems that faces the railroads today is the increase in the number of grade crossing accidents. The constantly increasing use of automobiles makes a solution of this problem all the more important.

"The railroads of this country have given and are giving serious consideration to this subject and are constantly doing everything within their power to bring about increased safety at highway crossings. Despite their efforts, as well as those of various other organizations interested in safety, there was an increase of 286 fatalities due to grade crossings accidents in 1926 over 1925. Last year, 202 persons were killed and 1,430 injured as a result of automobiles running into the sides of trains while automobile accidents at railroad crossings resulted in the death of 50 and injury to 69 passengers and employes of trains.

"A greater realization on the part of the motorist that he, too, must cooperate with the railroads, and use increased care in approaching and passing over such crossings is necessary. If this is done there can be little doubt that a reduction in grade crossing fatalities will be brought about."

C. I. Leiper, general manager, central region, Pennsylvania Railroad, spoke on "Safety from a General Manager's Standpoint," in Tuesday's session. Donald F. Stevens, general superintendent, northwest district, Baltimore & Ohio R. R., spoke Wednesday of "The Responsibility of the Division Superintendent and His Staff Officers with Respect to Safety Work." Other important ad-

dresses announced were those by Dr. Loyal A. Shoudy, chief engineer for the Bethlehem Steel Corpn., on "The Doctor and Safety;" "The Division Engineer and Safety," by George H. Warfel, assistant to general manager, Union Pacific System; "The Trainmaster and Safety," by J. A Nichols, trainmaster, Big Four Ry.; "The Road Foreman and Safety," by W. C. Bennett, road foreman of engines. C. & N. W. Ry.; "The Master Mechanic and Safety," by H. W. Maxwell, master mechanic, Boston division, N. Y. N. H. & H. R. R.

Freight Car Requirements

In a statement on the immediate freight car requirements in the southwest, George A. Leithner, district manager of the American Railway Association, said:

"For the second quarter of 1927, according to the report of 25 committees, representing practically every industry in the state of California, Nevada, Arizona and New Mexico, under the jurisdiction of the Pacific Coast transportation advisory board, estimates revenue freight car requirements exclusive of perishables, at 456,209 cars, as compared with 446,449 cars a year ago. This is an increase of 31,264 cars over 1925."

Perishable loading requiring refrigerator equipment is estimated at 65,120 cars, compared with 64,388 for the second quarter of 1926, and 10,042 cars more than for the corresponding period of 1925.

The railroads in the territory own about 72,000 cars and have on the lines 5 per cent in excess of their ownership, while freight equipment is subnormal, being 5 per cent below.

S. P. to Operate Bus Line

The Southern Pacific Co. has filed with the secretary of state at Sacramento articles of incorporation of the Southern Pacific Motor Transport Co. to operate as auxiliary to the railroad activities.

Commenting on the action Paul Shoup, executive vice president of the Southern Pacific, said:

"The competition of privately owned machines and of motor bus companies in connection with the construction of good highways in the territory served by this company has so decreased the earnings from certain trains, especially those engaged in branch line service, as to necessitate taking off these trains.

"It is desirable wherever practicable that the gap thus created be filled by dependable motor bus service established upon the highway, more especially that connections with trains may be maintained. In many instances this can be accomplished with the lesser operating costs of the motor bus, compared with the train and the added support to be gained from the traffic adjacent to the highways traversed.

"For these reasons the Southern Pacific Motor Transport Co. has been organized as a separate corporation with independent operation. This service will be developed as the need arises. The company will be empowered to engage in all forms of transportation, but for the time being its plans look only toward a passenger, baggage, mail and express service."

The foundation for successfully teaching the principles of safety lies in the schools and in the homes of the nation. It is from these sources that our children must learn the hazards which face the normal child or grown person, and be taught to safeguard life and limb.—H. R. Safford, Executive Vice-President, S. P. Co., Houston.

The Fuel Convention Program

The program for the nineteenth annual convention of the International Railway Fuel Association has been prepared. The convention will be at the Hotel Sherman, Chicago, May 10-13. The complete program:

TUESDAY, MAY 10

Invocation.

Addresses by E. E. Chapman (A. T. & S. F.), president; Carl Gray, president, Union Pacific; George Otis Smith, director, U. S. Geological Survey; Dr. H. Foster Bain, secretary, American Institute of Mining and Metallurgical Engineers.

Operating Factors in Fuel Efficiency, by A. E. Warren, general manager, central region, Canadian National.

The Train Dispatchers' Relations to Fuel Economy, by E. E. Regan, general superintendent, N. Y., N. H. & H.

Fuel Economies in Long Locomotive Runs, by T. H. Williams, assistant general manager, Southern Pacific.

The Human Element in Fuel Efficiency, by H. S. Rauch, division superintendent motive power, N. Y. C.

WEDNESDAY, MAY 11

Address for the coal industry by Walter Barnum, president, National Coal Association.

Report of committee on the preparation of coal and fuel oil, Malcolm MacFarlane (N. Y. C.), chairman.

Report of committee on fuel accounting, distribution and statistics, B. A. McDowell, (B. & O.) chairman.

Report of committee on storage of coal and fuel oil, Glenn Warner (Pere Marquette), chairman.

THURSDAY, MAY 12

Address by L. K. Sillcox, general superintendent motive power, C. M. & St. P., and chairman, mechanical division, American Railway Association, and F. S. Wilcoxen (Edna Brass Company), president, International Railway Supplymen's Association.

Report of committee on locomotive economy devices, George E. Murray (Grand Trunk Western), chairman.

Report of committee on stationary power plants, R. S. Twogood (Southern Pacific Co.), chairman.

Report of committee on firing practice, J. M. Nicholson (A. T. & S. F.), chairman.

FRIDAY, MAY 13

Fuel Fundamentals, by N. D. Ballatine, assistant to the president, S. A. L.

Report of committee on Diesel locomotives, L. P. Michael (C. & N. W.), chairman.

Report of committee on fuel stations, L. J. Joffray (Illinois Central), chairman; H. Morris (C. R. of N. J.), vice-chairman.

Report of committee on fuel bulletins, F. E. Bast (D. & H.), chairman.

Report of committee on co-operation with American Railway Association, Eugene McAuliffe (Union Pacific), chairman.

Report of representation at International Conference on Bituminous Coal, by W. L. Robinson (B. & O.).

Report of committee on co-operation with Railway Accounting Officers' Association, B. A. McDowell (B. & O.), chairman.

Report of committee on constitution and bylaws, T. Duff Smith (Canadian National), chairman.

Report of secretary-treasurer.

Election of officers.

The Building of a Great Harbor

Long Beach Spends Five Millions

CONTRACT for the Long Beach breakwater covers the greatest volume of rock breakwater construction to be let under a single contract in the history of harbor development. The specifications imposed upon the contractor monthly tonnage performance far in excess of any previous requirements. The work, now about two-thirds completed, has proceeded without interruption, and in point of volume is somewhat ahead of contract requirements.

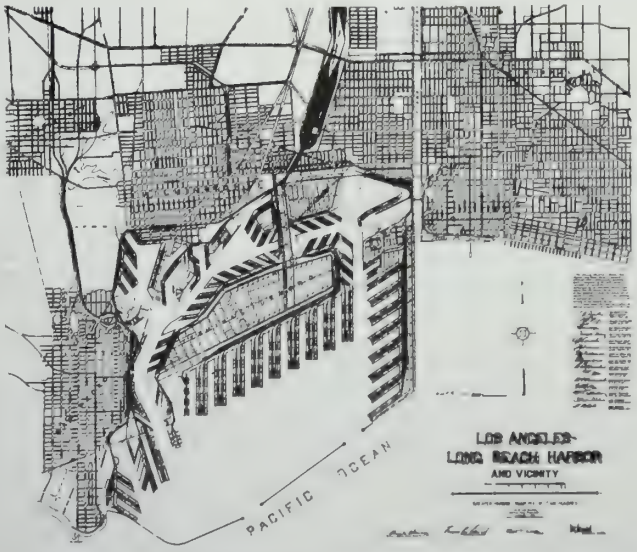
The breakwater work is being financed by a bond issue of the City of Long Beach for $5,000,000, issued to construct a breakwater, dredge an entrance channel and improve its harbor facilities. While not participated in by the United States government, the work is so designed that in its major portion it will form a part of the ultimate development scheme, and is performed upon the understanding that when the government undertakes to complete the ultimate breakwater development, the City of Long Beach will be credited its proportion of the cost with the work now being performed.

Geographically, the Long Beach and Los Angeles harbors constitute a single harbor, having separate ocean entrances but a contiguous protected anchorage. The San Pedro breakwater, constructed by the United States government in 1910 and 1912, protects the Los Angeles entrance. Until the work now under way by the City of Long Beach was well advanced, Long Beach entrance was without protection from ocean currents, and was not available for use by ocean going vessels. The rapid development of shipping tonnage to Los Angeles harbor, by the United States navy, brought about the cooperation of the government in plans for the development of an enlarged harbor with double entrance and ample, protected anchorage. The plans are well defined and practically adopted, but the government is not ready to proceed with construction.

The City of Long Beach, having determined to establish its community as a seaport city, as well as a pleasure resort, made its plans for the development of its end of the harbor, voted its bonds and, in advance of the government's action, proceeded with the protection for and dredging of its harbor entrance.

The location of the San Pedro breakwater will be noted extending out from the mainland on the westerly portion of the accompanying illustration. The Long Beach breakwater now being constructed, is indicated on the easterly side. The island breakwater, lying between these two structures, will be constructed by the United States government at some future time, completing the ultimate development plan for breakwater protection.

The slips and moles upon the ocean side of the fully protected harbor and along the Long Beach breakwater are not constructed, but represent the possibilities for ultimate development of the outer portion of the harbor. At the present time, harbor developments of the two municipalities are confined to the inner portions of the two harbors.



The San Pedro Breakwater is Shown at the Left, the Long Beach Breakwater at the Right Side of the Illustration

The contract for the Long Beach project provides for the placing of 1,624,000 tons of rock. Specifications require that the rock shall be of a character to resist the action of the elements and shall range in size from sprawls to 15 tons. The small rock is required to fill interstices in the core, and the armor, or outside rock, must be large to resist wave action. Specifications require that the contractor

Courtesy of Science Airplane Photos

1. Yacht Harbor. 2. Watchorn Basin.
3. Municipal warehouse, cotton compress, Pan-American loading dock, etc.
4. U. S. Immigration Station.
5. So. Pac. slip and E. K. Wood Lumber Co.
6. Main channel. 7. Gen. Petroleum loading dock.
8. Bethlehem Shipbuilding Corp.
9. Deadman's Island. 10. Fish Harbor.
11. Terminal Island. Arrows indicate piers of the Dollar, Luckenbach, California & Eastern, and other steamship companies, and plant of the Hammond Lumber Co.
12. Business district (San Pedro). 13. Timms Point.
14. Los Angeles Shipbuilding and Drydock Corporation, Standard Oil Company, etc.
15. Drawbridge. 16. Turning Basin.
17. Union Oil loading dock.
18. Los Angeles Steamship Co., City of Los Angeles at pier.
19. Mormon Island. 20. Catalina Terminal.
21. Calif. Yacht Club (just below figures), with the beginning of the Long Beach channel just to the right of arrow.
22. Watson Station. 23. Union Oil refinery.
24. Main Street (Harbor Blvd.). 25. Wilmington.

supply an average of 400 tons of rock every working day during the first month of the contract, 750 tons daily during the second month, 1300 tons a day during the third, fourth and fifth months, and thereafter to completion a minimum average quantity of 1750 tons every working day.

In no contract awarded by the United States government nor paritcipated in by it, and in no contract awarded by state, municipal or private interests for harbor improvement, has such a large quantity been specifie din a single contract, nor has such a large daily tonnage production been required.

To meet this condition, the contractor opened a quarry in a granite rock deposit, and developed a face about 2000 feet long with a vertical height in excess of 100 feet. The quarry itself contains something in excess of 12,000,000 tons to quarry floor level, and to date has produced about 1,200,000 tons.

Handling at the quarry is performed entirely with steam shovel. The rock is broken down with heavy "coyote" shots carefully calculated to require a minimum amount of secondary shooting and, as now developed, is capable of producing 5,000 tons a day, and is at this time working on an average daily production of 2,500 tons.

Suitable rock was not available close to the harbor. The quarry under operation is about 60 miles from the breakwater site, of necessity requiring rail haul. As both quarry and breakwater site are upon Union Pacific tracks, the project required the active cooperation of that company to bring about its successful handling.

The problem of placing this unprecedented daily quantity was not one of production alone. True, to confine the overhead of production to one quarry required, first, the length and height of face and, second, the ingenuity to develop mass production and loading facilities. The real problem, however, became one of unloading and releasing the rail equipment at the breakwater end. This problem was not worked out over night but has been met successfully through the coordination of the contractor and the railroad company.

After studying the situation, the contractor and railroad officers determined that quantity production would require the assignment of a considerable amount of equipment, and it became quite obvious that the problem of promptly loading and unloading the cars would be a big factor, not only in the ability to comply with the quantity feature of specifications but also in the matter of economical conduct of the work on the part of the contractor, as well as the railroad company.

The first few thousand tons were handled exclusively on flat cars, using stakes and side boards, and unloaded by means of a steam shovel with caterpillar traction. This was reasonably successful from the viewpoint of economy in unloading but involved considerable delay to equipment and the maintenance of labor gangs at both ends to place, remove and handle for return to the quarry, the side boards and stakes.

In its effort to overcome the objectionable feature of delay to equipment and to reduce labor cost, the Union Pacific tried a few of the Clark 100,000-lb. capacity pneumatic dump cars. The first trial demonstrated so thoroughly the efficiency and economy of this equipment that the railroad, upon the urgent request of the contractor, immediately put into service an additional number of this type of car. While because of the quantity production and the large amount of equipment required, flat cars are still used, it is found that the turnaround as between flats and the Clark cars is four loadings of the Clark cars to one of the flats.

The Clark 100,000-lb. Capacity Pneumatic Dump Car Used by the Union Pacific at Long Beach Breakwater

The work is being performed by the Hauser Construction Co. which owns and operates the quarry, as well as handles the entire breakwater end of the work, and is under the direct supervision of that company's general manager, K. B. Kumpe. The engineering supervision is being handled under the direction of the Long Beach city harbor department, with Col. E. N. Johnston, U. S. Army Engineers, retired, as consulting engineer, and Major R. G. McGlone, as chief engineer.

The accompanying photographic reproduction shows the development that may be expected in the Los Angeles-Long Beach harbor following the completion of the entire breakwater project. While it will be noted that separate entrances are provided, the harbor itself, it will be seen, really is a single harbor, and the facilities for direct access to and from the ocean, as well as ample, protected anchorage, make this manmade harbor one of the best in the world.

This work, begun August 31, 1925, soon will be history. Its completion is promised January 1, 1928. Long Beach harbor now has a protected entrance channel 500 feet in width, dredged to a depth of 40 feet at low tide. The breakwater and mole protection is so far advanced that recent heavy storms created no difficulties to shipping using the entrance and resulted in no silting whatever.

An able man shows his spirit by gentle words and resolute actions. —Chesterfield.

Millions for Rivers and Harbors

General Jadwin Plans A Busy Year

By Walter Hall

THE expenditure of $65,477,365 on river and harbor improvements for the fiscal year ending June 30, 1928, has been recommended in the annual report of Maj.-Gen. Edwin Jadwin, chief of engineers, U. S. Army.

Other recommendations for California work included Los Angeles harbor, $1,800,000; San Francisco harbor, $110,000; Oakland harbor, $345,000; Richmond harbor, $20,000; San Pablo bay and Mare Island strait, $500,000; Suisun bay channel, $30,000; Napa River, $500; Petaluma Creek, $60,000; San Rafael Creek, $50,000; Humboldt harbor and bay, $350,000; Crescent City harbor, $50,000; San Joaquin River, $25,000; Stockton and Mormon channels, $5000; Mokelumne River, $1400; Sacramento River, $95,000; Sacramento River flood control, $1,000,000; Yuba River debris control, $30,000; regulation of hydraulic mining, $18,000.

The total appropriation, under the report, would be divided as follows:

For river and harbor work, general, $54,659,365; Mississippi River flood control, under Mississippi River commission, $10,000,000; Sacramento River flood control, under California debris commission, $518,000; examinations, surveys and contingencies, $500,000.

General Jadwin also asked for $3,043,870 for civil projects under his jurisdiction that do not come within the scope of river and harbor improvements, yet are closely related thereto. These include $2,000,000 for road building in Alaska.

In addition to the California recommendations, the report provides for the following Pacific Coast expenditures:

Oregon—Coguille River, Ore., $28,000; Coos Bay, $150,000; Coos River, $3,000; Siuslaw River, $39,000; Tillamook Bay and bar, $34,000; Columbia River and tributaries, $5000; Snake River, $14,000; Columbia and lower Willamette Rivers, below Portland, Ore., and Vancouver, Wash., $440,000; Willamette River above Portland Yamhill River, $46,000.

Washington state—Lewis River, Wash., $2000; Skamokawa Creek, $2100; Deep River, $10,200; Willapa River and harbor, $30,000; Grays harbor and bar entrance, $200,000; Puget Sound and tributary waters, $39,000; waterway connecting Port Townsend Bay and Oak Bay, $7500; Seattle harbor, within city limits, $12,000; Skagit River, $3000.

Other recommendations include:

Minnesota Baudette harbor and river, $4000; Warroad harbor and river, $19,800; Duluth and Superior harbor, $82,500; Grand Marais harbor, $2000.

Chicago district—Chicago harbor, $137,000; Chicago River, $26,000; Waukegan harbor, $20,000; Calumet harbor and river, $76,000; Illinois River, $76,000.

Mississippi River — Mississippi River headwaters, $5000; Mississippi River, Minneapolis to Missouri River, $2,225,000; Missouri River to Ohio River, $3,000,000; Ohio River to head of passes below New Orleans, 1571 miles, under jurisdiction of Mississippi River commission, $10,000,000; Southwest Pass, $420,000. Total Mississippi River, headwaters to Gulf of Mexico, $15,670,000.

Ohio total river locks and dams, $8,250,000.

Missouri River—Missouri River Mississippi River to Kansas City, $2,500,000; Kansas City to Sioux City, Ia., $20,000.

An article in a Boston newspaper of 1829 dwelt on the utter foolishness of building a railroad to Albany that no one would use after it was built, and that it would cost as much as the value of the whole state of Massachusetts, and would be as useless as a "Railroad to the Moon."

Iconoclastic Legislation

THE legislator must recognize the interest of the management, also the interest of the owners, also the interest of the employes, but in addition to all he must recognize the interest of the larger party, which is the public.

I know about the effort to repeal the surcharge. I understand the ground upon which it is put. I respect those who are making the effort. But I have never agreed with them. Until we can find some other revenue to take the place of the $40,000,000, I do not see how the charge can be repealed, and for that reason I have continued to oppose it.

—SENATOR FESS (O.) in address at Annual Banquet, Railway Business Association.

Transportation of the Future

Railways, Motors or Planes

By Samuel M. Felton

Chairman, Chicago, Great Western

TO PROPHESY anything with respect to the character of transportation in the future would be difficult unless we admit, for the sake of brevity, that the country eventually will have that form of transportation which it can and does support adequately.

The dissemination of truthful information, the realization by the public that the United States Constitution means just what it says when it declares private property—I am thinking now of railroads—shall not be taken for public use without just compensation, must convince the public, finally, that it can not expect railroads to operate trains, freight or passenger, unless that operation gives to its producers a fair return on the money invested.

In short, the public must realize, and I believe it is realizing more and more, that it can not have any form of transportation at someone else's expense; that it can not have railroads for bad weather uses only; that it can not have steam and electric railways, and motor buses and trucks unless it supplies sufficient traffic to warrant their operation.

The American public, I believe, is now very nearly convinced that capital, morally and legally, is entitled to its wages, precisely as workmen are entitled to wages. Furthermore, as enlightenment spreads through education, the day will come, if it is not already here, when the people will admit that these wages must not be denied merely because capital chances to represent the accumulated savings of many persons rather than of one or a few, and that therefore, a railroad is entitled to a fair deal just as any other industry is entitled to it. No railroad asks for any more than this. The law-makers of this great country should see to it that no less is given them. When this Bill of Rights has found lodgement in the public conscience we shall be fairly on the way to determining the character and the quality of the transportation this country is to have.

Samuel M. Felton

The old rule of the survival of the fittest is likely to have some influence in shaping the future character of transportation. He who argues against this or that or the other form is wasting his time. If the people wish to use motor buses or private automobiles, or even airplanes, they will use them. Men still young remember the time when the automobile, as a commercial factor, was declared to be an impracticable thing. But this, it should be remembered, is just what wise people said about railroads not so very long ago, people who refused the use of schoolhouses for lectures about this form of transportation then just appearing on the horizon. Men now playing golf, or trying to, ridiculed aviation as a commercial possibility only a few years in the past. Scientific gentlemen who had a reputation for knowing, usually, what they were talking about scoffed at Marconi's wireless, as others before them had derided Field and his Atlantic cable, and Bell and Morse, and every other man who dreamed and worked for the advancement of human living.

But all these things have come into common use in our daily lives. We may talk to London now without wires. Photographs made this morning in New York, appear in the evening papers on the Pacific Coast. It would take a very confident man, indeed, to prophesy anything in these high-pressure days.

Transportation in varying forms has been advancing as rapidly as progress in other industries. Twenty years ago there were few automobiles in the United States—there were more in Europe—but today there are more than twenty million motor vehicles, and probably 2,750,000 of these are trucks. Indeed, so fast are they increasing that practically all high buildings now erected give up one or several floors entirely to caring for the tenants' cars, and double deck streets already are being demanded to relieve the traffic congestion.

In Current History for January

it was reported that more than 50 per cent of the civilian airplane orders in four western states were from residents of ranches, and the observer declared he had seen hundreds of private aircraft tied up in fence corners, lanes, and pastures near farm houses. At Phoenix, Ariz., Omaha and Los Angeles airplanes are seen every day, according to this competent authority, come to city or town for supplies for cattle ranch or farm. Of course, the younger generation is responsible. The record shows, too, that in the fiscal year not one fatality occurred on any American aircraft line operating under regular organized procedure, a record not equalled in any European nation with subsidized air lines.

In view of such developments as these who is to forecast, with any certainty of hitting the mark, the future character of transportation in America?

No forward - looking railroad man thinks seriously any more of opposing motor transportation. The railroads of England lost their short-haul traffic long ago to the motor trucks, but the English railroads still are operating, and fairly profitably, even in a country where short-haul traffic was much more remunerative than it ever was in America. The fact that trucks are getting much traffic in this country does not mean that the railroads are going out of business, any more than across the water. Over here many of our railroads are using trucks and buses as part of their own service, and this, I believe, is far the more satisfactory way of maintaining it.

Obviously, no railroad can provide the frequency and flexibility of movement which now characterizes the motor bus or truck with their door-to-door pickup and delivery. For short-haul traffic such conveyances, if properly managed, doubtless will become more and more popular. What the railways have lost to them in passenger revenues they have more than made up in additional freight created by the motor industry. Properly regulated by the government, state and federal, there is no reason why these motor vehicles should not have the traffic they can handle.

Motor bus competition is responsible only in a small way for the very serious decline in railway passenger receipts. A man may, for novelty's sake, take a motor bus trip from Chicago to Los Angeles, but he is not likely to return the same way. For that matter it is quite commonly understood that very few persons ever cross the continent twice in their own private automobiles, and many persons owning cars in the suburban districts near cities use the buses, often because of the parking problem.

Railroads will continue, I imagine, in the future as in the past, to handle the country's long-haul traffic, freight and passenger, because, for one reason, no form of transportation yet devised has provided the same speed, comfort, and safety at so low a price. All these elements, except the price, are increasing constantly on American railroads.

Motor buses, now reaching a very high standard of luxury, are not entirely responsible, as I said a moment ago, for the decrease in our passenger receipts. Private automobiles, outnumbering every other kind of vehicle, have taken the toll, and for this form of independence there is not, under our beneficent government, any check, although there seems to be for everything else. But even private automobiles have their value in teaching the love of travel. And this, it must be admitted, is a very important, revenue-producing lesson to keep before the people.

The Importance of Potatoes

The potato crop now ranks sixth in value and eighth in acreage among the agricultural products of the United States, according to a study just completed by the bureau of railway economics.

"As a table food," said the study, "potatoes are second only to the wheat crop. The potato crop during the last 50 years has grown with the population but at a somewhat faster rate. The per capita production was 2.98 bushels for the period 1870-79 and 3.58 bushels for the period 1920-25."

The study shows the very wide distribution of potatoes. Idaho potatoes enter 35 states, while those from Maine and Virginia go into 28. Alabama, Wisconsin, and New Jersey ship potatoes to 26 states. During the year ended with October, 1926, the study shows that of 36 of the principal cities in this country, 25 received potatoes from one-third or more states in the United States. In some instances, potatoes were shipped to those cities in larger quantities from far-distant states than from large producing areas closer at hand. Chicago receives its potatoes from a larger number of states than any other important market, potatoes being shipped to that city from 37 states.

'Fraid of Number 13?

"One of these days the Pullman Company will skip No. 13 in the berth list and make it '12½'," said M. R. Montgomery, ticket clerk in the Houston city offices of the Southern Pacific. "Of course nobody is the least bit superstitious, but it's funny how very few persons will take No. 13 in making a reservation. In fact I have had many patrons who rather than violate any factor of preservation, took an upper, rather than the berth down stairs with the unsavory distinction. Some hotels have no '13' on their room roster. As the Pullman Company is making all sorts of refinements in its sleeping cars, I have no doubt it will get to the matter some day."

"Don't throw your tongue into gear before you get your thought started."

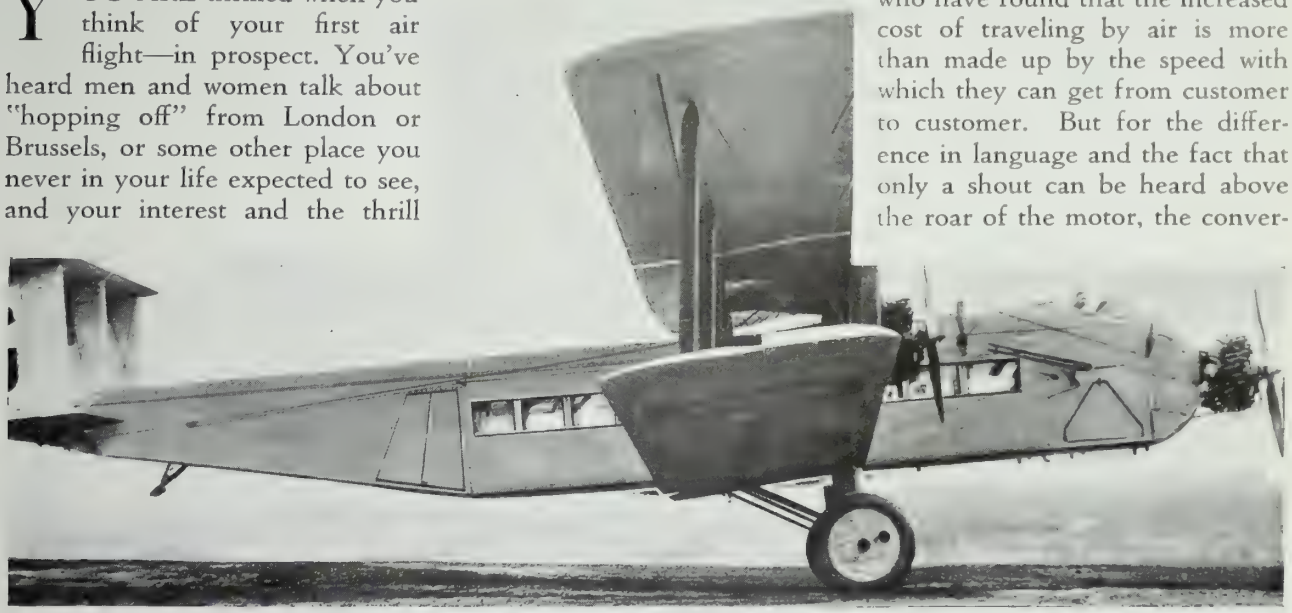
Digging wells is the only business where you don't have to begin at the bottom.

From London to Paris by Air

A Thrill With Paper Bags Handy

By James W. Brooker

YOU ARE thrilled when you think of your first air flight—in prospect. You've heard men and women talk about "hopping off" from London or Brussels, or some other place you never in your life expected to see, and your interest and the thrill of it stay with you up to the moment the weighing-in begins. About that time you hear someone who probably would joke at a funeral, refer to "no visible means of support," and then—well, you are into it, and away you go. You enjoy every minute of the great adventure unless, perchance, you have the feeling which, someone says, starts in the pit of the stomach and ends in the paper bag. There'll be more about the bags in a moment or two.



The Argosy, One of the Largest Passenger Airplanes In Europe With Accommodations for Twenty Persons.

Flying has become commonplace in Europe. Not merely professional flying by trained aviators, but flying by the man on the street. Whenever he wants to go anywhere in a hurry and has the necessary money to pay his fare, he flies. It is possible to go everywhere and anywhere about Europe, with only very broad limitations, by plane.

Between London and Paris the planes usually are crowded with American tourists, but most of the other routes are far from being dependent upon the tourist trade. The line from Malmo, Sweden, to Brussels, is made profitable almost entirely by Swedish match salesmen going south, and Swiss cheese salesmen going north, and their compatriots in like businesses. Most of the lines, in fact, derive the major portion of their revenue from commercial travelers who have found that the increased cost of traveling by air is more than made up by the speed with which they can get from customer to customer. But for the difference in language and the fact that only a shout can be heard above the roar of the motor, the conversation on the Malmo-Brussels plane, and many others, would be not at all dissimilar to the conversation on the Chicago to Los Angeles trains.

Interior of Airplane Cabin, Looking Aft

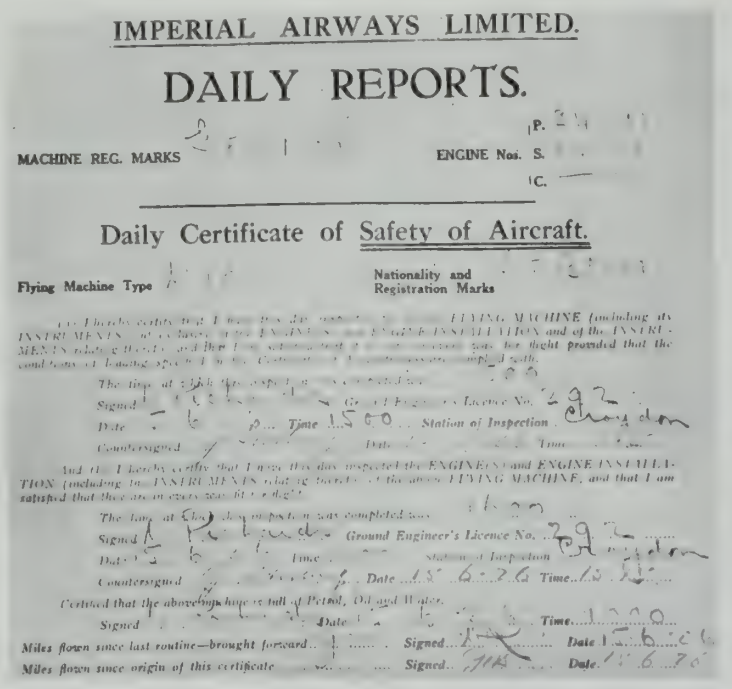
Persons who are afraid to go up are becoming scarce, and, in Europe at least, will soon become as nearly extinct as those who are afraid to ride in automobiles. There are comparatively few crashes. With the tremendous number of planes that were flying here and there about Europe this summer, there were only two smash-ups, one near Prague, in Czecho-Slovakia, and the other in Kent, England, on the London-Paris flight. The coat of arms of the most prominent British flying company contains the motto "Semper Securus". This may not be literally true, but it is sufficiently near the mark to conquer all prejudices and qualms.

The mere fear of height is no deterrent to flying. In the comfortable cabins of the passenger

planes there is little or no sensation of tremendous height. Except shortly after rising and shortly before landing, the solid ground is so far away as to lose its threatening solidity. Besides, it would be impossible to maintain such an emotion as abject fear for as much as eight or ten hours at a stretch on some of the longer flights.

After the first two or three times up, it is not at all difficult to assume a blase attitude toward flying. As a matter of fact, in the presence of the uninitiate, particularly of the opposite sex, it is difficult not to assume such an attitude. I am always vaguely nervous while flying. Usually, the exhilaration of being in the air is sufficient to keep this in the background, but it always reappears just before the landing is made. This nervousness is traceable to the first flight I made. A pompous colonel of infantry and I went up with a reckless youngster during the World War. The colonel had never been up before, and he invited the pilot, condescendingly, to do his stuff. The pilot took the invitation very literally and it was weeks before I got my stomach back to its proper place. Despite a keen enjoyment of being in the air, I shall be quite content, for the rest of my life, with straightaway flying, and leave stunts to those who like that sort of thing. Frankly, I don't.

It is interesting to watch the reactions of a beginner both before and during the first flight. When we flew from London to Brussels this summer, it was the first time my wife had ever been up. She was agog with eagerness and enthusiasm for weeks in advance, but when we left the Hotel Victoria in the bus bound for Croydon, and the actual journey was so close at hand, this enthusiasm waned with startling rapidity. All through the preliminaries of weighing ourselves and our baggage, I could see her eagerness leaving her. When we were actually seated in the plane, however, and she saw what a large and safe apparatus it appeared to be, some of her enthusiasm returned, and she was distinctly happier. This lasted until the motors began to hum. As the big ship taxied down the field preparatory to taking off, my wife looked regretfully and sadly at the solid ground. But when we hopped off and spiraled gracefully and steadily upward, all her dreams were realized, and from that moment she was an ardent flying fan. Fortunately, the day was fine, so that we had no occasion to use the paper bags kindly provided by the management for use by the passengers in case the air is bumpy and their stomachs weak. Except in bad air conditions, once one of those giants gets into the air at proper flying height, there is almost no motion, and there is far less likelihood of air sickness than there is seasickness on even the largest liners.



IMPERIAL AIRWAYS LIMITED.

DAILY REPORTS.

MACHINE REG. MARKS ENGINE Nos. P. S. C.

Daily Certificate of Safety of Aircraft.

Flying Machine Type Nationality and Registration Marks

[illegible] FLYING MACHINE (including its INSTRUMENTS [illegible] ENGINE INSTALLATION and of the INSTRUMENTS [illegible] was for flight provided that the [illegible]

The time at which this inspection was completed was [illegible]

Signed [illegible] Ground Engineer's Licence No. 292

Date [illegible] Time 1500 Station of Inspection Croydon

Countersigned [illegible] Date [illegible] Time [illegible]

And [illegible] I hereby certify that I have this day inspected the ENGINE(S) and ENGINE INSTALLATION (including the INSTRUMENTS relating thereto) of the above FLYING MACHINE, and that I am satisfied that they are in every way fit for flight.

The time at which this inspection was completed was [illegible]

Signed [illegible] Ground Engineer's Licence No. 292

Date [illegible] Time [illegible] Station of Inspection Croydon

Countersigned [illegible] Date 15-6-76 Time [illegible]

Certified that the above machine is full of Petrol, Oil and Water.

Signed [illegible] Date [illegible] Time [illegible]

Miles flown since last routine—brought forward [illegible] Signed [illegible] Date [illegible]

Miles flown since origin of this certificate [illegible] Signed [illegible] Date [illegible]

A Daily Airworthy Certificate Filed by Inspectors at Croydon Field, Near the City of London.

The novice at flying is almost never nervous, nor afraid at the time of landing. Most persons fail to realize that this is where the real danger, if any, lies. The experienced pilots of these planes make such beautiful landings, however, that it is all over, and the plane is taxying on the field before the beginner discovers he is out of the air. Eight voyages on various types of ships in various places in Europe, this summer, failed to bring out any but perfect three-point landings, and these with monster ships, ranging all the way from ten to sixteen passengers, not including the pilot and mechanician.

If the day is clear, as it was for us in both directions, flying across the English Channel is a remarkable experience. The planes are not equipped with pontoons for water landings, and for this reason they fly across the narrowest part of the channel, practically above the regular boat crossing between Dover and Calais. The lack of pontoons also requires them to fly high, to have room to glide to the nearest coast in case of difficulty.

It is a marvelous sight to be flying over the Kentish fields and see the coast of France across the channel. The channel itself is beautifully colored, the immense liners seem like toy boats in a park lagoon. The ability to see some distance into the water from the air gives the channel a peculiarly mottled appearance, caused by the presence of seaweed not far below the surface. The famous shoals, bane of the channel swimmers, are also clearly in evidence.

The neat fields and straight roads of Belgium and France, with the red-roofed houses placed with almost mathematical exactness, make a charming view from a plane.

The stability of the planes while in the air is a source of wonderment to beginners. They never seem to expect that, once in the air, the ship, if its load is properly distributed, will fly itself. Every item to be carried, including the passengers themselves and their baggage, is weighed carefully before the flight starts. The passengers are assigned seats according to their weights. Each passenger is entitled to carry thirty pounds of luggage free, a fact which doubtless serves to depress the thrifty women travelers as they remember the painful limitations in packing most of their family possessions into a trunk holding 150 to 200 pounds for a railroad journey.

It is perfectly possible to get up and walk around in the cabins while the flight is in progress. In fact, the mechanician always leaves his seat ahead at some time during the flight, and walks back through the cabin on an inspection trip.

More and more travel luxuries are being installed in the planes. Luncheons are served by tiny stewards, and recently a plane with sleeping accommodations was put on for the Berlin-London flight.

The pilots and mechanicians are all carefully trained and tested men, with long flying experience. In England, they are licensed only after passing rigid medical, flying and technical tests conducted by the Royal Air Ministry. They are re-examined regularly at least every six months.

Every machine is equipped with wireless telephones, and the pilot is in constant communication with the various air ports. These 'phones are also used to guide the machines safely to their destinations when there are heavy fogs.

One of the Late German Planes in Flight.

Nearly all the landing fields are, perforce, at some distance from the city, but at all fields buses are provided to take the passengers to or from some central location in the city.

On many of the flights it is necessary to book seats considerably in advance. The Paris-London flight always is well filled, despite the fact that there are three planes daily in each direction.

The cabins of the planes are entirely enclosed, so that, winter or summer, ordinary traveling clothes are all that are necessary. As a matter of fact, the average American feels the lack of fresh air on a long flight. The windows may be opened, of course, but only at the risk of black looks from the continental passengers. Flights are made in all sorts of weather. It is rarely they are suspended, and then only for as long as the unusually bad weather lasts.

The companies operating air services in Europe are: British: Imperial Airways, Ltd.; Swedish: Oktisbolaget Aerotransport; Danish: Det Danske Leftfartselskab; German: Deutsche Left Hansa, A. G., and Deutsche-Russische Luftverkehrs G.; Belgian: S. A. Belge d'exploitation de la Navigation Aerienne, and French: Ad Astra-Aero Avion Turisme S. A.

The Imperial Airways, Ltd., which operates the Paris-London service and others, is perhaps the largest, although the German Hansa Company also does a large business.

The fares are rather high, but this is only to be expected in view of the large operating costs. The fare from London to Paris is $31.36 one way and $57.44 for a round trip. But the planes take only two and a half hours' flying time whereas the boat and train take seven hours and a quarter. In addition, the rough crossing of the channel is avoided. Ironically enough, the channel was smooth as glass both times we flew over.

There are 92 air ports in Europe, scattered through every country except Greece and Bulgaria, with daily services to each one. Of these, Germany has by far the largest number, thirty-five.

Passengers Are Permitted Thirty Pounds of Luggage in European Air Flights. Over Here We Call It Baggage.

In addition, six North African cities are served by air from Marseilles, France, and Alicante, Spain, where connection is made with the London plane. It is possible, for example, to fly from London to Fez in Morocco in 53 hours, a journey that occupies six days by boat and train. The longest through flight in Europe is from London to Constantinople, 48 hours, as compared with 93 hours by boat.

A flying company operates even in Albania, a country but recently emerged from Middle Age civilization, and regular service is maintained from Scutari to the outlying mountain towns of Tirana, Valona, Kortcha and Elbason. There is also a regular service between the Riviera, via Ajaccio on the island of Corsica to Tunis, in Italian North Africa. Guernsey, on the Channel Islands, has daily service to Southampton, England. It is possible to fly from London to Helsingfors, Finland, in 30 hours, a journey which takes nearly six days by boat.

An enormous number of lines radiate from Berlin to all parts of the German Republic, and to all other countries as well. The Hansa Company is making great strides, despite the dampening effect of a few quite serious accidents.

Some of the possibilities of German aviation were revealed early in the winter by the trial trip of the new Dornier "Superwhale" airplane at Berlin. The machine is intended to carry 21 passengers, but on its maiden journey no fewer than 60 invited guests were transported, at an average speed of 117 miles an hour. It is announced that six more planes of the same type will be put in service next spring.

Another new type of airplane also has entered the air in Germany, built of duraluminum, driven by three motors of 250-horsepower each and the plane having a wing spread of nearly 90 feet. By special device in its construction the noise of the motors and propellers has been considerably muffled, so that it is possible for passengers to converse in ordinary tones while flying through the air at full speed.

The Germans are so converted to the idea of aviation that at one flying field alone at Berlin during October there were 581 arrivals and 592 departures of air machines.

W. Irving Glover, second assistant postmaster general in charge of transportation, said not long ago that nothing can stop the development of air passenger service. "Now that the air mails are going over to private concerns," said Mr. Glover, "these concerns assuredly are not going to depend solely on mail carrying for their maintenance. They have, in fact, already arranged for the purchase of the most powerful and comfortable 'ships' now in existence, planes such as are used on the larger air routes in Europe.

"The main reason why air travel has not become as popular in this country as it has in Europe is due to the fact that so far we have had nothing but 'gypsy flying.' There is a passenger service but it is not always reliable. The companies that are taking over the government contracts, however, will make it reliable."

There were fourteen air-mail routes being operated by private concerns for the government January 1, this year.

U. S. Air Industry Grows

IN Current History for January, C. K. Spencer, director of the Aeronautical Review, says in an enlightening survey of aviation in America, that greater progress in that science was made in this country in 1926 than in any country in any year of the four epochs in which its history usually has been divided. These four periods are the experiments mythically believed to have been made by Daedalus to the launching by Professor Langley of his "Aerodrome" in the Potomac River in 1903. The second epoch extended to the opening of the World War in 1914. The third period covered the rapid progress of design and construction during the war, and continued until the beginning of 1926, because areonautics was still under the influence of the war. The year 1926 was the beginning of the fourth epoch.

"Whatever the critics of America's air policies may aver, reports from other leading countries show that the United States possesses more commercial aircraft than three other great nations combined", says Mr. Spencer. "Moreover, both federal and contract air mail services are succeeding on a paying basis; unsubsidized American aviation has filled every manufacturer's books with orders far into the future; competition and the rapid purchasing of aircraft manufacturers' agencies are proceeding with almost the same impetus as in the early days of the American automobile industry. With the exception of long flights, the United States has contributed vastly more to scientific aviation in the past fiscal year than any other country; indeed, more scientific expeditions were completed than in all Europe."

How the S. P. Saved Fuel Oil

The Record of Seven Years' Work

By C. W. Watson

S. P. Fuel Efficiency Trophy

THROUGH a high degree of intelligent cooperation and competition among officers and employes nearly three million barrels of fuel oil were saved in freight and passenger service on the Pacific lines of the Southern Pacific Co. between January 1, 1920, and December 31, 1926. The precise figures, as shown in the report of J. N. Clark, chief fuel supervisor for that company, were 2,915,747 barrels, and that is a lot of oil.

The report shows that during those seven years the fuel per thousand gross ton - miles, in freight service, decreased from 15.47 to 11.94 gallons, the locomotive load increasing from 1145 tons to 1509 tons. In passenger service fuel decreased per passenger car mile from 1.11 to .95 gallons, the cars per locomotive mile increasing from 7.19 to 8.13.

In 1926 a saving of 553,618 barrels was recorded as compared with the year 1925. The freight consumption per thousand gross ton-miles was reduced from 12.43 to 11.94 gallons, and passenger consumption from .99 to .95 gallons per passenger car mile.

Pyramiding costs and the gradually widening breach between production and consumption of crude oil in California is bringing to railway operating officials and executives more every day a problem that is assuming serious proportions, due to its important bearing on successfully conducting transportation in oil burning territory.

In years past when crude oil sold in the open market at a price even less than one cent per gallon, scant attention was given to economy. But now the Southern Pacific on its Pacific system uses fuel oil exclusively on nine of the twelve divisions in locomotive operation, and depends entirely on California fields for its supply. Prices have gone up along with consumption. It has become a matter calling for close and careful attention. Fortunately, during the period when supply more than equaled the demand, the California fields were able to put into storage sufficient stocks to serve as a reserve for the future. This storage kept the railroads and other industries in the Pacific Coast region in a going condition, but it can not be expected that the reserve will last indefinitely.

Obviously, conservation was necessary, with efficient handling, to make every gallon of fuel oil do more work than a gallon ever had done in the past. To accomplish this, required team work, and the active cooperation of every employe connected with train operation and power production. Conserving fuel is not a one man proposition. Aside from efficient locomotive loading, new power, proper assignment of power, train and locomotive handling and condition of power, train delay is the most important factor in economical operation. All these factors have been kept constantly in mind.

J. N. Clark, Chief Fuel Supervisor, Southern Pacific Co.

The Southern Pacific buys fuel oil under a contract requiring certain specifications as to heat units, absence of impurities. Deliveries are made through pipe lines, tank cars and oil steamers to suit local conditions. The company was one of the larger users of this kind of fuel to institute a system of checking and control, resulting in substantial economies. The plan adopted in 1911 requires a daily report of train and locomotive movements to be compiled by superintendents and mailed in duplicate to the fuel bureau two days after train movement, where ton-miles, fuel consumed, average tons per train and gallons of fuel oil per 1,000 gross ton-miles for all enginemen and locomotives are computed. Superintendents receive from the fuel bureau a completed copy of the report within three to six days after the train movement. Where fuel consumption appears excessive the superintendent takes up the matter by letter with engine crews to determine the cause, giving the fuel bureau copies of the correspondence.

Reports showing the fuel performance of engineers, firemen and locomotives listed by type of power and character of service are compiled monthly by the fuel

bureau. Copies are sent to all general and division officers interested, and others are posted on enginehouse bulletin boards. Crews consuming more than the average of fuel are notified by their superintendents and are invited to offer explanations and suggestions to effect an improvement. Good performances are commended. Master mechanics and road foremen use performance sheets to detect excessive fuel consumption by enginemen or locomotives.

Superintendents compile loose leaf cumulative records of performances of engineers, firemen, and locomotives to identify quickly any excessive consumption. One copy of this record is sent to the foreman of engines.

A recapitulation sheet showing fuel performance and locomotive load by divisions is sent monthly to all officers interested. Divisions failing to effect economy in fuel compared with the same month of the previous year receive special attention from the fuel bureau. All divisions have fuel oil committees composed of: four engineers, four firemen, one conductor and one brakeman.

Fuel meetings are held bimonthly on all divisions with superintendents as chairmen. Members of the fuel committee, superintendents' staff, representatives of the fuel bureau, and officials and employes from all departments are expected to attend, and are invited to offer suggestions bearing on fuel economy. The duties of the fuel committee are to study methods pertaining to fuel consumption, and to create interest in the subject of fuel economy by fellow-workers. These meetings are well advertised by bulletin notices and by letters to members of the committee. Addresses are made by experts on superheaters, feedwater-heaters, boosters, etc. Ways and means of effecting fuel economy are freely discussed, and recommendations are either disposed of at the time or are referred to a committee for investigation and report at the next meeting. Representatives of the fuel bureau present graphic charts showing fuel performances of the divisions for the preceding two years, and statistics for the current and corresponding month of the previous year. Minutes of fuel oil meetings are distributed to all officers and employes, and extracts are published in the company's monthly magazine.

More Miles to the Gallon

"Fuel conservation, in which tremendous progress has been made in the last decade, recorded still greater advance in 1926. For every 1,000 tons, including weight of locomotive and tender, moved over the company's Pacific lines, 128 pounds of coal were burned, compared with a coal consumption of 132 pounds to perform the same work in 1925.

"Although most of our locomotives are oil-burning, we translate the heat-unit performance of oil into coal heat units, which are standard in American railroad accounting."
—J. N. Clark, Chief Fuel Supervisor, Southern Pacific Co.

To increase the employes' interest a motion picture entitled "Fuel Conservation" was produced under the direction of the chief of the fuel bureau and his staff. The film was taken generally under actual operating conditions, and illustrates proper and improper practices and their effects on fuel consumption. All data in the film are current, and new scenes are being added from time to time. The picture is displayed at fuel meetings and at terminals. It is shown in two sections. Part one deals with the work of production of crude oil. Part two is devoted to the use of fuel oil in actual railroad operation, and emphasizes losses and waste through defects and improper practices, showing clearly the necessity for forethought and cooperation by operating officials and employes. The attention of employes is directed to the many leaks, which if observed in their daily work, will result in large economies yearly. The final scene typifies what may be seen some day, a once prolific industry—total exhaustion of the oil fields, and the consequent results, a catastrophe which, through methods of conservation, the Southern Pacific is trying to forestall.

Diamond Set Gold Badge Awarded J. R. Falvey, S. P. Engineer, for Fuel Efficiency

To promote interest still further, and encourage friendly competition a trophy cup is awarded quarterly to divisions making the greatest progress in fuel efficiency. The division winning the cup three times retains it permanently. So far the Stockton and Salt Lake divisions have become the permanent owners of one of these cups. Enginemen receive various rewards for excelling in fuel performance. One engineer and one fireman having the best fuel record for the year and the best record for interest as reflected by attendance at fuel meetings and suggestions offered, are sent by the Southern Pacific from every division as its representatives to the annual convention of the International Railway Fuel Association held usually in Chicago. As another inducement a gold-plated cap badge, similar in form to standard cap badges, is awarded quarterly to the engineer and fireman showing the best fuel record in through freight, local freight, through passenger and local passenger service on all divisions. Upon winning the award a second time a gold and enamel star is inserted in the badge, and these insertions of stars continue until the individual wins the award twelve

times. For the thirteenth award a diamond is placed in the badge. The back of the badge bears the engraved name of the winner and the date of award. The only employe ever to be awarded the diamond is J. R. Falvey, engineer on the Overland Limited route between San Francisco and Roseville. Falvey was employed as a fireman by the Southern Pacific in 1891. He became an engineer in 1897. Evidently Falvey had acquired the knack of using the least amount of fuel to produce results. Indeed he acquired such skill, his employers say, that during the last five years his efficiency has never fallen to the average record even for a single trip.

In addition to the foregoing rewards the superintendents of divisions select ten engineers and ten firemen having the best fuel performance for the month in through freight, local freight, through passenger and local passenger service, publish their names in an efficiency list and give them proficiency certificates signed personally by the superintendent. The efficiency list is posted on bulletin boards in all enginehouses. Names of winners are published in the company's magazine.

Stationary power plants also receive attention through a special committee. This has saved large amounts of money through improvements and the correcting of mechanical defects in boilers and furnaces, and the proper instruction to employes operating the plants.

In organizing and operating a bureau or department for checking fuel consumption full cooperation between transportation and and mechanical departments is of first consideration for, no matter how much effort be made, no practical achievements can result without cooperation. To mechanical department officials is entrusted the

J. R. Falvey, Southern Pacific Engineer Who Won the Diamond Badge.

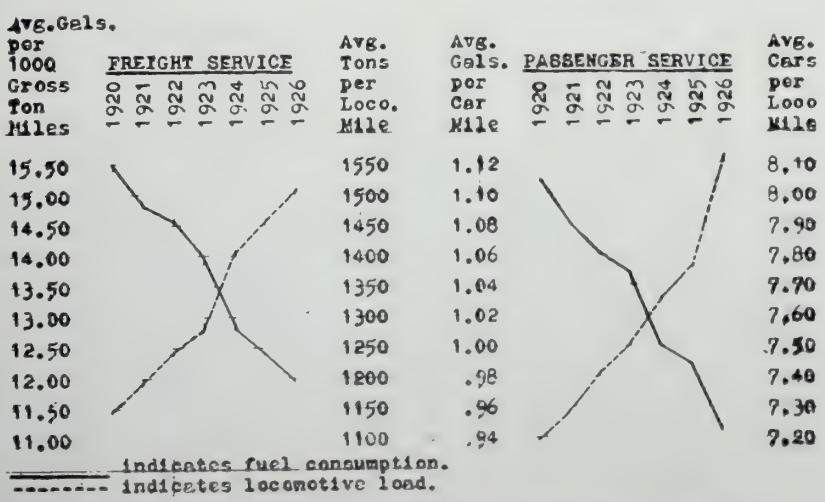
improvements in design and efficiency of the power, the installation of superheaters and other capacity-increasing factors so essential to any scheme for fuel economy.

The plan under which the Southern Pacific's fuel bureau is operated covers the whole field of fuel handling and consumption, and in the movement for economy embraces everyone whose duties relate to transportation, from the general officer in charge to the call boy. Superintendents, trainmasters, dispatchers, master mechanics, road foremen, trainmen, enginemen, station agents, enginehouse foremen, yardmen, car men, section foremen, water foremen signal maintainers, engine dispatchers and call boys—all have their respective parts in eliminating waste.

P. E. Net Was Lower

Operating revenues of the Pacific Electric Ry. Co. amounted to $19,111,164 compared with $19,514,324 for 1925. The operating expenses, excluding taxes for 1926, were $16,404,651 and $15,976,043 for 1925, leaving net operating revenue of $2,706,512 for 1926 and $3,538,280 for 1925. During 1926 taxes charged to operation amounted to $1,143,351 and for 1925 to $1,181,699. Deducting the taxes leaves operating income of $1,563,161 for 1926, and $2,356,581 for 1925. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, (which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus), of $1,944,949 for 1926, and $2,895,937.08 for 1925.

One should be courteous, not cringing, to superiors; affable, not familiar, to equals; kind, not condescending to inferiors.



Graph Showing Southern Pacific Fuel Performance in 1920-1926

Proviso Yards Cost 16 Millions

C. & N. W. Project at Chicago

By F. W. Sargent

THE improvements being made by the Chicago & North Western Ry. Co. in the vicinity of Chicago are a part of a general program for the revision of its Chicago terminal operations so that all road train movements may be terminated at a point outside the city, where switching and classification work will be handled, and the facilities within the city devoted exclusively to the delivery and receipt of freight.

When the project is completed all road trains will arrive at and depart from one yard, all traffic will be handled between this point and the city and to connecting lines in switch trains, and various yards at present used for several purposes will be relieved and rearranged for the more economical and expeditious handling of city traffic.

The new yards are at Proviso, thirteen miles west of Chicago on the Galena division at a point where the Indiana Harbor Belt R. R. connects with the Chicago & North Western Ry. and where the latter company's outer belt, which links up its four radiating lines, connects with its Chicago-Omaha line, which is its most southerly line radiating from Chicago.

The yards contemplated will contain 260 miles of tracks, covering an area about five miles long, and containing approximately 1250 acres. There will be three sets of yards for the inbound or eastward moving traffic, and three sets of yards for the outbound or westward moving traffic, sufficient in track capacity for the handling of 6000 cars eastward and 6000 cars westward every twenty-four hours. The inbound or eastward

President Sargent

set of yards will have a receiving yard of thirty tracks, each capable of holding 100 cars, or a total of 3000 cars. This yard will be so arranged that trains arriving from the west off the Galena division will enter one side of it, and those arriving from the north via the various lines of the Wisconsin division will enter from the other side.

There will be an inbound classification yard, also having a capacity of 3000 cars, and beyond this two departure yards each of 1500 cars capacity. One of these will be to receive cars destined to the Indiana Harbor Belt R. R. and other connections, and the other for cars destined to team tracks, freight houses and industries on the Chicago & North Western Ry. Co.'s tracks.

Two receiving yards for outbound traffic will be provided, one to receive cars from the Indiana Harbor Belt R. R., which will have a capacity of 1650 cars, and another to receive cars from industries and freight houses, which will have a capacity of 1500 cars.

An outbound classification yard of 3000 cars capacity will be constructed, and a departure yard arranged for 100-car trains.

A yard having a capacity of 2000 cars will be added later for "hold" cars on inbound traffic, and a yard of 3500 cars capacity for storage and overflow to accommodate outbound movements.

An LCL freight house, with tracks having a capacity of 725 cars at one setting, is being built. LCL traffic will be brought here from the city freight houses in trap cars, and to some extent in motors, and loaded for destination.

The project involves a total expenditure of $16,000,000.

Track rearrangements necessitated moving the main line, which formerly ran through the yard. This was done in 1924. The inbound receiving yard was constructed in 1926. The LCL freight house has been started and will be completed in 1927. The receiving yards for outbound traffic will be constructed this year. It will require five years of construction work to complete the project.

It is impossible to forget that when the storms force down the airplanes, and the transcontinental motor buses are mired in the mud, and the owners of private automobiles find it impossible to travel because of bad roads, and someone wishes really to get somewhere in a hurry, it is to the railroads they go. Bad weather friends in reverse.

Electric Line Traffic Increases

Seven Thousand Buses Used

ELECTRIC railways experienced a year of even development during 1926. There was a gradual increase in traffic in the industry as a whole. This stood out in marked contrast to every other year since the war. They have been characterized by traffic slumps and peaks. Traffic on 217 properties, comprising 85 per cent of the country's total mileage, for the first eleven months of 1926 showed an increase of 1.21 per cent over a similar period for 1925. By far the greater part of this increase is, of course, found in the metropolitan districts and the large cities.

Other outstanding achievements were miles of track constructed and reconstructed, cars purchased, new bus lines opened, receiverships lifted, and increased advertising and selling activities.

Coordination of electric railway and bus services under the management of traction companies progressed rapidly. Experience having proved this kind of operation gives better service and is more economical, public officials and company managements generally are striving to bring it about to the fullest possible extent. One great advantage of such operation is that transfer facilities can be arranged.

As a result of this coordination more than 7,000 buses now are being operated by approximately 275 electric railway companies over more than 15,000 miles of route. Buses generally are being used in extending transportation routes with but little service paralleling the main rail lines. Independent competition is decreasing because buses cannot operate profitably at electric railway fares, and also because it is no longer possible to purchase efficient buses except upon reasonable financial terms.

Almost 2,000 new city and interurban cars were purchased during the year, an increase over 1925. It is estimated a total of $263,830,000 will be spent for equipment and supplies during 1927. This is an increase of about 13 per cent over expenditures for last year.

Receiverships continued to decrease, there now being only 55 companies out of a total of more than 800 in receivership. The total mileage of companies involved in receivership in 1926 was 1,230, but the 590 miles belonging to the Chicago Railways presents an unusual situation. This was a voluntary receivership to conserve the property at the expiration of a franchise. The property is in splendid condition, and its traffic and revenue are growing steadily.

Electric railway fares increased substantially during the year, and are now at their peak for all time. The average cash fare of companies operating in cities of 25,000 population and over is now 7.74 cents compared with 7.60 cents a year ago. Incidentally, motor bus fares have also trended upward during the year, the average cash fare of 203 companies being 8.50 cents now, compared with 8.46 cents at this time last year. Due to the joint effect of an increase in traffic and an increase in the average fare, the gross revenues

One of the Pacific Electric Railway's Suburban Steel Trains. This Company Recently Reduced Its Rates in Certain Regions In An Effort to Increase Traffic.

of the industry also rose during 1926. Preliminary figures indicate that the gross receipts were nearly two per cent greater than in 1925. Expenses, however, have also increased, so that there will be little or no change in the net revenue from operations.

The increase in expense was caused by slight increases in the cost of materials and labor. The increase in material costs was comparatively small, and the increase in wages about one and one-tenth per cent.

No doubt remains as to the future of electric railway transportation in the large centers. The electric car has demonstrated thoroughly that it will remain the backbone of mass transportation. The small city line still is a problem. Most electric railway abandonments have been in cities of from 8,000 to 25,000. The solution in some of these centers may be substitution of buses at higher fares.

Some interurbans are stabilizing their business by carrying freight and express. Others, which never should have been built, are not doing so well.

Outstanding problems of the industry are, traffic congestion, which slows up cars; taxes, which are the highest of any industry in the world, and the increasing use of the private automobile in daily business. Managements generally are approaching these problems progressively. They are effecting great operating economies, using paid advertising and other proved forms of salesmanship and on the whole are confident of the future.

Herbert the Mule

Why is it that whenever human beings—like goats—wish to visit some almost inaccessible spot not intended originally for their attention, they choose a mule to haul them there and back? Because, as any Missourian and some other persons know, this animal—like a certain unmentionable motor car—can be depended to make the round trip.

The mule shown at the extereme left in the illustration supplies the power on the journey from Inspiration Point to Picture Rock on Mt. Lowe. He is a faithful representative of a very faithful and hard-working family whose really fine points are not always appreciated. Part of the way he pushes the car and part of it he goes into low and holds back.

Herbert is this mule's name, and he is said to be the most photographed mule in the world, which may be true. One thing at least is certain, and too many persons forget it, Herbert is giving his passengers a good time with his one-mule power, the same power that people used for transportation long before railways, steam or electric, were conceived by the brain of man. There are times when Herbert's glances toward the crowd suggest that if he could be arrested for his thoughts he wouldn't long be out of jail. Even a mule's patience has a well defined limit, as some men have learned.

"Herbert," the World's Most Photographed Mule, Pushing His Daily Load.

Frisco's Traffic Still Grows

While 1925 was thought to have been a banner year in an agricultural way throughout the territory served by the Frisco Lines, the report of the agricultural department of that railroad reveals a still further increase in 1926 in most of the perishable products shipped on Frisco rails, and an even greater money yield to the growers of the crops. Figures show that a total of 18,083 carloads of perishables were handled in Frisco trains during 1926, and that the total value of the crops was $38,340,000. In the previous year 16,736 cars were moved representing a market value of $35,728,050 and the figures for 1925 were 20 per cent higher than those of 1924. The increase was made in spite of rather unfavorable marketing conditions, and in the face of some unseasonable weather which brought about a decrease of 1400 cars of apples in 1926 over 1925.

Prizes for Safety Essays

The American Railway Association has announced plans for a nation wide essay contest among school and college students with three cash prizes of $250 to be awarded the authors of essays containing an outstanding, readily available suggestion for preventing accidents at grade crossings. One prize of $250 will be awarded for the best essay by a grammar student, a similar prize for the best essay by a high school student and a like amount for the best essay by a college student.

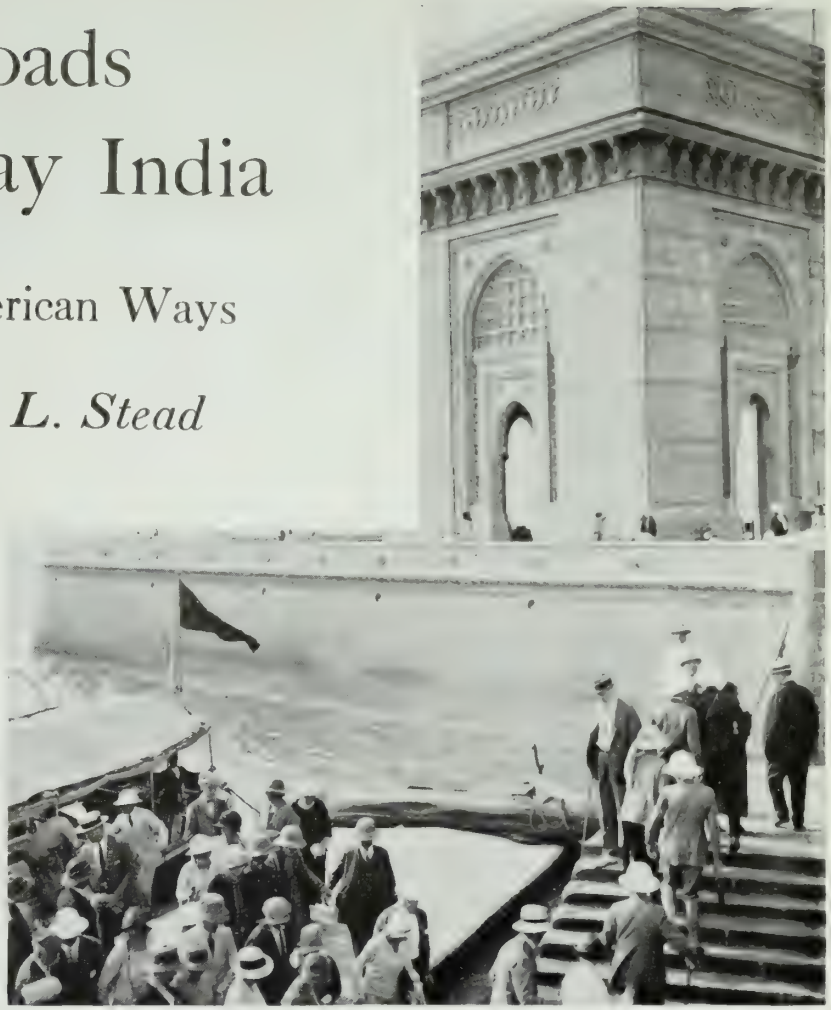
Under the rules prescribed the subject of the essay is to be "Cross Crossings Cautiously" and all essays are to be limited to 250 words. Essays must be terse, logical and constructive and must stress the need for greater care in approaching and passing over railroad crossings. Essays are to be sent to J. C. Caviston, secretary of the safety section of the American Railway Association, 30 Vesey Street, New York, not later than June 1.

Happiness was never purchased; it must be worked for. And, remember, there is a great deal of difference between satisfaction and happiness.

Railroads in Faraway India

Copying American Ways

By Arthur L. Stead



Where East Meets West, a Party of Chicagoans Landing at Bombay's Apollo Bunder.

VISITORS from America are astonished and much pleased over the unusually large passenger stations in India at wayside points. A degree of comfort and commodiousness quite strange to travelers is encountered practically everywhere in these stations, some of the waiting rooms resembling concert halls in area.

Because of the differing religious beliefs of the Hindoo and the Mohammedan, which races form the bulk of the Indian native population, two distinct waiting halls are provided for Indians at every important depot, as well as suitable accommodation for the white man and the educated native. For the native, too, there are elaborate bathing and refreshment facilities, bathing being a religious rite held sacred by the Hindoo during and immediately after a railroad trip. Bathing pools are installed at many stations reminiscent of the swimming pools at exclusive American country clubs, with artistic fountains playing musically alongside.

Americans Visiting the Burning Ghat, Bombay.

The procedure of the Indian native when setting out on a railroad journey is quite different to that of the busy American. Time is of little account for the natives. Many hours before the train is scheduled to depart, scantily-clad, they gather at the terminal with prodigious piles of baggage and cooking utensils. A rare task is that of the station staffs in maintaining order among the undisciplined crowd of brown-skinned, jabbering humanity, as they wander here and there about the depot. For the ticket seller there is an argument with almost every traveler, and for the staff on the concourse, questions galore to answer concerning train services and the like.

Native travelers in India are provided roomy, but plainly furnished cars, exclusively for their own occupation. For the white man there is luxury accommodation of a high order, but frequently it is accommodation of a somewhat different kind to that provided by the crack trains of America.

Each section of an Indian first-class car usually is occupied by two travelers only. The seats, convertible into beds at night, are arranged in a line with the direction of travel. Before beginning the journey the traveler sends his native servants down to the depot with his mattress, blankets, provisions and other baggage. A valise is placed on the car seat to

The New Station of the Great Indian Peninsula Railway at Poona.

serve as cushion, and each traveler usually takes his own servant along with him to care for his needs on the journey.

On the principal Indian trunk routes, there have been introduced recently more modern passenger cars and diners. A new train, put into service between Bombay and Calcutta this season, actually ranks as one of the most luxurious railroad services in the world.

This remarkable train is known as the "Imperial Indian Mail." It is operated by the Great Indian Peninsula, and the East Indian roads, and runs in connection with the mail steamer from and to Europe. Five vestibule cars and two mail cars form the train, and the equipment includes easy chairs, card tables, a refreshment bar, bathrooms and special sleeping berths. Described as the last word in tropical luxury travel, the seats on this train, eastward bound, are almost all reserved for passengers booking their accommodation in London prior to departure of the Indian mail steamer. In this respect the train probably is unique in the history of railroad transportation.

In all, four classes of passenger cars are operated on the Indian roads, and 600 million passengers annually are handled. The four car classes are styled respectively

Indian Sleeping Car. American Tourist Specials are a Feature of Cold Weather Passenger Business in India.

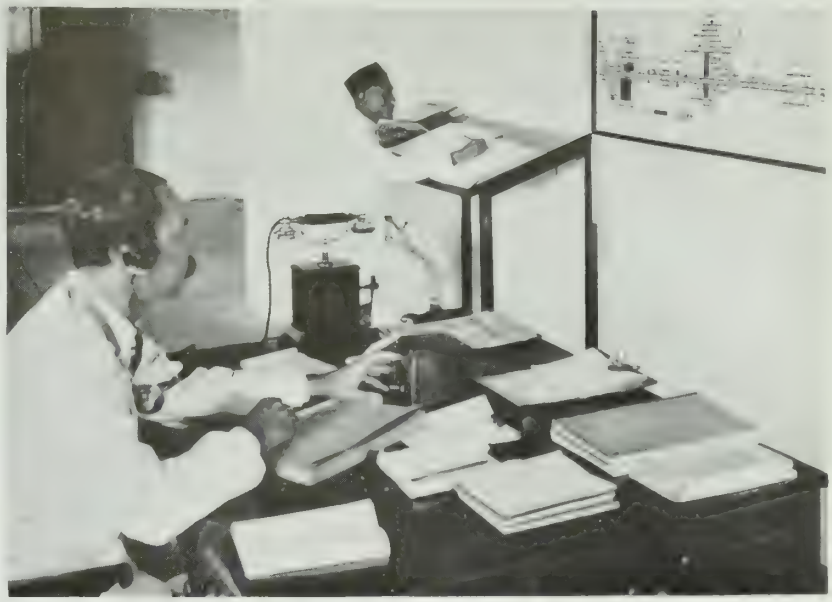
first, second, intermediate and third class. First class is reserved for white travelers and better-class natives; second-class provides similar service at a somewhat lower fare; intermediate class cars are utilized largely by native family parties; and fourth class is allocated exclusively to the ordinary native passenger, who can travel immense distances at the extremely low rate of nearly two miles for one cent.

Special car ventilating apparatus, electric fans, colored windows, and window shades are a feature of Indian travel. In the window frames the hot air of the sun-steeped plains is rendered refreshingly cool by being passed through sweet-smelling grass mats, kept continually moist by water supplied from roof reservoirs. In the cool season, extending from October to April, American globe trotters find admirable transportation through this scenic wonderland in special tourist trains composed exclusively of parlor, dining and sleeping cars. This American travel is growing remarkably in volume, and special staffs now are engaged each tourist season in catering to American needs.

Many peculiar problems face the railroad man in India in the movement of freight traffic. The great difficulty is the handling of the traffic when it is offered. India is an agricultural country, and the main crops are reaped during

India's First Electric Train. An Eight-Car Special Approaching the Bombay Terminal, Great Indian Peninsula Railway.

eight or nine months. The first crop is tea in Bengal. Then follows jute. After that the cotton crop in central, northern and western India, then the rice crop in Burma, and after that the oilseed and wheat crops in northern and central India. A very heavy traffic thus falls upon the railroads over a short period from about the middle of September until toward the end of June. To deal with this traffic satisfactorily the railways are strained to the utmost. The average haul of freight traffic is 196 miles, and much of this business is shipment traffic to and from the coast. Admirably equipped freight depots, fast freight trains composed of all-steel high capacity cars, modern hump marshalling yards, and vast deep water docks at the sea terminals are reminiscent of the best American practice.



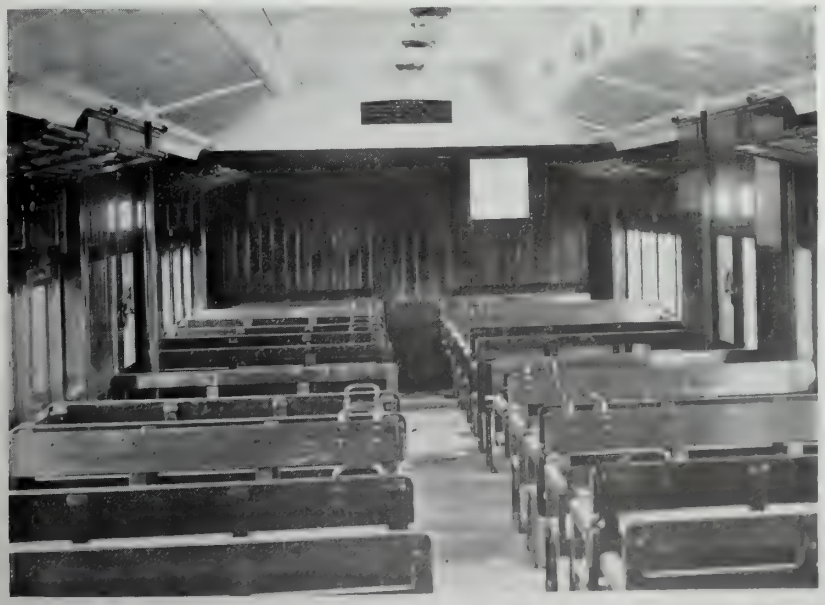
Train Control is Operating Efficiently in Faraway India. This is the Central Office at Bombay.

India is essentially a land of contrasts. East and West, the very ancient and the ultra-modern, everywhere are found in curious and piquant juxtaposition. Alongside stately railway termini, accommodating the daily de luxe limited trains which speed across the continent, primitive two-wheeled "tongas," or bullock carts, driven by half naked, brown-skinned natives, play their humble part in Indian transportation. Outside the modern hotels operated in conjunction with the railroads, where the white man and educated native dine in splendor beneath the flapping punkahs, hordes of dusky natives press and jostle in the dense throng of the garlic-scented bazaars. America's railroad conquest has been remarkable indeed, but in India the change wrought by the iron road is nothing short of miraculous.

When Robert Stevenson, son of "Geordie," the pioneer of the old Stockton & Darlington road, first stepped ashore at Bombay to open in 1853 the first railway serving India, he could never have dreamt how rapid was to be the development of the railroad in this faraway land of romance, nor how miraculous was the progress thereby to be achieved in every direction in the years which lay ahead.

Cause for satisfaction in the fruits of his life's work, the railroad man in India has to the highest degree. British engineers and operating officers, aided by native subordinates, have here transformed pest-haunted jungle into fertile farmlands, caused flourishing cities to grow out of rude insanitary hutments of wood and grass, and given to each of India's 320 million souls the glorious opportunity for progress that comes of scientific nation-wide railroad development.

The 24-mile-long railroad opened in 1853 between Bombay and Tannah was the embryo out of which has sprung the 40,000-mile network of shining steel stretching today from Karachi to Calcutta, and from sun-kissed Ceylon to the snow-clad Himalaya Mountains. The Bombay-Tannah pioneer road was formed of flimsy iron rails. It had ten or twelve primitive passenger cars and three diminutive locomotives. Today, ten big trunk railroads serve all parts of India, as



Somewhat Suggestive of Early Day Suburban Trains at Chicago. Third Class Suburban Car in India.

well as a number of smaller undertakings. They own 10,000 locomotives, 25,000 passenger cars, and 210,000 freight cars, and give employment to 750,000 workers of every grade.

India's principal western railroads are the Great Indian Peninsula, the Bombay Baroda and Central India, and the North Western Railways. Bombay is the headquarters terminal of the two first-named undertakings, and Lahore of the North Western. The Great Indian Peninsula runs eastward to Calcutta, northeast to Delhi and southeast to Madras. Bombay and Delhi also are linked by the Bombay, Baroda and Central India system; while the North Western, as its name indicates, serves all northwestern India from Delhi and Karachi to rugged Afghanistan.

The East Indian is another important system, running from Calcutta to Delhi and Jubbulpore, in Central India. Calcutta and the Central Indian states also are connected by the Bengal-Nagpur Railway; and the fruitful Ganges Valley by the Bengal & Northwestern road. In the south are the Madras & Southern Mahratta, and South Indian roads, serving all the picturesque southland.

Four gauges are favored in India. There is the broad gauge (19,000 miles), consisting of 5 ft. 6 in. track, corresponding with the American 4 ft. 8½ in.; the metre gauge (15,500 miles) used in sparsely populated territory; and two narrow gauges of 2 ft. 6 in. and 2 ft. respectively. The 5 ft. 6 in. track was originally adopted as a preventive measure against sideway derailment by cyclonic winds. In practice it has proved an immense asset in enabling increased car space and added comfort to be afforded the hot-weather traveler in this tropical land.

An epic of engineering is the story of the construction of India's vast railroad network. A land of great spaces, immense mountains and wide and fast flowing rivers; a land where climatic conditions vary in different parts from the equatorial almost to that of the Arctic regions, and where all skilled labor and mechanical equipment had at the outset to be imported from outside sources; this great empire has demanded the highest degree of skill and resourcefulness on the part of its railroad builders.

Some of India's outstanding railway construction work is the crossing of the Western Ghat Mountains by the Great Indian Peninsula road. Here the trunk routes leading from Bombay to Calcutta and Madras, respectively, snake their way across the heights by inclines, cuttings, tunnels and viaducts innumerable, to enable connection to be established with the interior. The Thul Ghat crossing has a rise of 972 feet in nine miles, and the Bhore Ghat crossing a rise of 1,831 feet in 15 miles. On the latter work there was employed an army of 42,000 men for seven and a quarter years. The construction included 25 tunnels having a total length of 3,985 yards, eight viaducts, 1,623,102 cubic yards of excavation in cuttings, and 1,849,934 cubic yards of filling in embankments. Today the Bhore Ghat crossing is being subjected to realignment in order to cope with ever-increasing business, and in preparation for electrification.

Climatic and other conditions varying so greatly from those ruling in America, the methods of construction and operation favored on the Indian railroads naturally differ somewhat from American practice. Broadly speaking, however, the British and American roads have formed the models upon which the Indian railroads have been built and worked. For track work on trunk routes, 100-lb., 90-lb. and 80-lb. rails generally are employed, carried on wooden ties or iron pots, with roadbed of slag, stone or ashes. The road generally is admirably maintained and smooth running on trunk routes invariably is enjoyed.

While one or two of the larger Indian roads manufacture their locomotives in their own shops, the most of the engines utilized are of British make. Almost every type of machine is found in service, from gigantic Garratt articulated locomotives in the mountain sections, down to diminutive narrow-gauge engines which puff and chug on the feeder roads in sparsely populated territory. Enginemen are mainly Europeans or Anglo-Indians, and the firemen native Indians. Train signaling is provided for by modern block equipment, with automatic signaling over many of the busier routes.

To facilitate the movement of traffic several of the larger Indian roads have introduced a special dispatching system known as the train control. This system is supplementary to the ordinary train signalling arrangement, and provides for supervision through a central office, in telephonic communication with all junction signal towers, important stations and marshalling yards, of the whole of the train movement throughout wide areas.

Indian railroadmen claim for themselves possession of the most beautiful city passenger terminal in the world. India's Grand Central is the property of the Great Indian Peninsula road. This remarkable depot is known as the Victoria Terminus, and is in Bombay, the great seaport of Western India. A jewel of the railroad architect's craft is this vast domed mass of stone decorated with point, column and statuary. Christened "Victoria Terminus" in honor of the late Queen Victoria, this station is the starting point of the fast through limited trains running across the continent, and the headquarters terminal of one of India's most progressive railroads. In other cities, railroad stations are found second to none in beauty of design and liberality of layout.

In the field of electrification, commendable progress is being re-

corded in India. The roads serving the port of Bombay are leaders in this effort, both the Great Indian Peninsula, and Bombay Baroda and Central India systems having converted their Bombay suburban zone tracks to electricity.

Bombay, like New York, is an island city, and its population of 1,200,000 was until recently herded within the congested limits of the city. Hand in hand with electrification, there has proceeded the opening up of new garden suburbs outside the city proper, and out of the Victoria terminus of the Great Indian Peninsula road there now operate 75 electric suburban trains daily. Direct current at 1,500 volts supplies the motive power through overhead conductor, passenger service being maintained by train units composed of one motor and three trailer cars, two or more coupled units forming a train. Eventually there is contemplated trunk road electrification on a big scale.

Railroading in India has created unexpected possibilities of remunerative employment for the native population. Almost all the subordinate positions are held by natives, while official posts usually are occupied by skilled Britishers. In recent years, however, educated natives have been encouraged to qualify for the more responsible railroad jobs, and the higher positions are being increasingly awarded to those in this class who have proved their worth.

Elaborate native training and welfare plans form part of the policy of every Indian road. Native apprentices are admitted at competitive examinations, and graded according to their educational qualifications. Usually the Indian apprentices who speak and read English are placed in the higher grade, and attend classes at the apprentices' school along with European and Anglo-Indian youths. For the lower grade apprentices English tuition forms part of the curriculum. Special classes are conducted in shop mechanics, station duties, train working and signaling, and well-equipped hostels are run for apprentice boarders. Whole-time welfare officers are deputed to care for the moral and educational needs of all.

The British officials who play so important a part in Indian railroading usually are sent out to India at ages varying from 21 to 30 years. Many receive their preliminary training on the railroads of Britain, and for the go-ahead young railroadman to whom residence in a tropical climate offers appeal, there is vast scope for promotion in the Indian railroad world.

There is not one modern railroad activity, from up-to-date traffic operating and mechanical procedure to traffic solicitation and railroad catering, that the Indian roads have not taken up with enthusiasm. The American globe-trotter as he visits in turn the glorious milk-white Taj Mahal at Agra, the beauty spots of Kashmir, the colorful Ganges river front at Benares, and the sun-steeped pagoda-land of Madras, never fails to express appreciative comment on the wonderful efficiency of India's railroads, and of the ability and courtesy alike of British and native railroad workers. India is full of miracles: the greatest miracle of all in this centuries-old land of lore and legend is that performed by the railroad man in his daily service to steel and steam.

Missouri Pacific Net Up

Operations of the Missouri Pacific R. R. in 1926 were more profitable than the year before, the annual report revealing an increase of $3,158,632 in railway operating revenues and net income of $8,631,667, which exceeded the total for 1925 by $983,458. Freight revenue gained $3,594,372, the principal increases being agricultural products $1,839,898; products of mines, $500,425, and from manufactures and miscellaneous, $1,229,560.

Passenger revenue was $16,035,972, against $16,536,035 in 1925, a decrease of 3.02 per cent, all of which was in local system sales. The continued diversion of short-haul passenger traffic to motor vehicles operated over public highways is apparent, the report said. Total railway operating expenses increased $575,444.

Some Foreign Construction

The maharajah of Nepal has caused to be built the first passenger railway in this country, running 24 miles, from the British frontier station at Raxaul through the malaria territory to Ahekhanj. The opening of the line was presided over by the king of Nepal, says a dispatch from Calcutta.

The lines runs through the heart of the jungle in which the maharajah recently shot 12 tigers and three rhinoceroses. The sides of the line have been cleared for half a mile in the hope of decreasing the malaria and settling the emancipated slaves. The journey from the British front to Khatmandu, capital of Nepal, has been reduced from three days to 24 hours.

A single track railway, 24 miles long and costing $2,000,000 will be built on the Island of Bermuda. Horse drawn vehicles and boats have been the island's sole means of transportation since 1908, when automobiles were excluded. The railroad will be built for the Bermuda Railway, Ltd., by the Eastern Engineering Co., of Brooklyn, N. Y.

A bill has just been presented to the new session of the Icelandic legislature for the building of the first Icelandic railway, through the island's best agricultural lands, in order to open the territory and permit it to compete in the world markets.

Real men take a lot of punishment from experience, and then go back for more.

It Isn't So Far to Chicago Now

No Hardships Today, Just Speed

By Charles Dillon

Lather, on a Fast Train, Often is a Matter of Taste

DISTANCE is, after all, only a matter of time, not miles. In what we, in America, call the early days, meaning sixty or sixty-five years ago, when time was not much of a factor, distance meant hardships, privation, great dangers, and very often death. A journey from the Missouri River to California took months, and along the old Santa Fe, and the Oregon Trails once there were frequent proofs, grim with tragedy, white and silent reminders of those who had dropped by the way. Long lines of covered wagons, the prairie schooners of western literature, crawled across the arid plains in those days, dusty and sun-baked faces with dreary eyes, tired to death of the endless space, watching always for Indian signs, a place to camp in safety—over the limitless plains where speedy trains now flash across the same wastes in just a few hours.

A few old men, not many, still warming themselves in the genial sunshine somewhere, — and some of the loyal women who journeyed with them in their youth—can put a proper measure of value on these modern luxuries, by contrast. But it is very doubtful whether the rising generation, so much maligned for its sophistication, born and reared in comparative comfort ever estimates rightly the great development in transportation, or in the western half of the continent. For most of these youngsters the De Luxe Limited is a commonplace thing, and the train without a beauty specialist, a barber, a tailor, a valet and a maid, something to be avoided. So fast do we move in America.

Around the Horn by sailing ship, across the plains with oxen, horses or mules, the pony express, the stage coach, the leisurely, pioneering wooden railroad trains with coal stoves for heaters, candles, then oil lamps, then the "marvelous" Pintsch gas-light, as an early advertiser called it, electricity, steam-heat, all-steel equipment, oil-burning or electric locomotives, and here we are making the trip from Chicago to the coast in sixty-three hours! Every day, week in and week out, they are doing it, the Santa Fe, the Southern Pacific, Union Pacific, seldom late on any line, the last word, we fondly suppose, in easy, smooth speed.

But is it? Already the energetic and jealous Northwest demands still more speed. Sixty hours from Chicago to Puget Sound these people want for Tacoma and Seattle and Portland. Seventy hours, they declare is a waste of time to go that distance, a wail coming from men whose fathers or at least grandfathers would have been delighted to make it in two months.

Railroad men sat back and smiled with satisfaction when they contemplated their arrangements for sixty-three hour trains last fall. They did the same thing, a few years ago when the time was cut to sixty-eight hours from seventy-three. And, of course, they know that sixty-three hours is not the limit by any means. They know we are living in a fast age. A man on the coast now wires his friends in Chicago on Friday that he will take din-

The Union Pacific-North Western's Fast Los Angeles Limited, Near Pomona, Calif.

ner with them the following Monday. He can write these persons that day, too, knowing that 20 hours later his letter, carried by the air mail, daylight and darkness, will be received. He can telephone them, if he wishes, and has the price, or he can talk by radio. Think of Pintsch gas in such a time!

For the average passenger nowdays, the man who doesn't feel he must be somewhere else within the shortest imaginable time or burst a blood vessel, it takes seventy hours or a little more to go to Chicago from Los Angeles. Sixty-eight hour trains on most of the railroads are common. Eighty-eight to ninety or ninety-two hours is a fair record from the coast to New York including the lapsed time at Chicago. But it has been done very much faster, faster than any trains now running, and may yet be done in even less time than the best of the records of 1926.

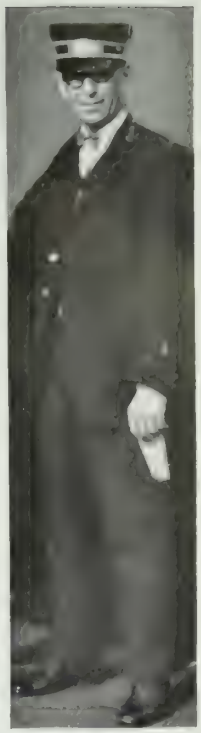
One risks somewhat dangerous conflict to say much about speed records in railroading, a risk as great as that incurred in referring to the largest locomotive or the biggest airplane. It is such a big country and there are so many persons in it doing such a variety of very remarkable things every day. But never-the-less there are certain records, official or unofficial, and most of them are worth knowing about. There was the Jarrett-Palmer theatrical train, for instance. More than fifty years ago Jarrett, a theatrical manager in New York, wished to reach San Francisco in 84 hours. A special train was chartered on the Pennsylvania at Jersey City. It started from that place at 1 o'clock the morning of June 1, 1876. There were twenty-five passengers, among them three actors due to appear on the stage in San Francisco the evening of June 5. Also there were correspondents from various European and New York papers, two representatives of the English army, and others. A magazine report of the trip is diverting in these days of flashing trains. "An unequalled feat," says one, "the movement of a train of cars in one direction at forty miles an hour including stops for three and one-half days!"

Engineer F. Redden Pulled the First Santa Fe Chief

Chief Yowlache, the Gent in the War Bonnet, Helped the Santa Fe's Flyer Out of Los Angeles.

It would still be a feat.

The time schedule prepared for the train, which consisted of an engine, a combination baggage and a dining car, was as follows: To Philadelphia, 90 miles from Jersey City, 1 hour 45 minutes; Harrisburg, 196 miles, 4 hours; Altoona, 327 miles, 7 hours; Pittsburgh, 444 miles, 10 hours; Chicago, 913 miles, 20 hours; cross Mississippi River at Clinton, 23½ hours; Omaha, 1,405 miles, 32 hours; Cheyenne, 1,932 miles, 40 hours; Ogden, 2,435 miles, 55 hours, San Francisco, 3,317 miles, 84 hours.



Santa Fe Conductor Traphagen

The 90 miles between New York and Philadelphia was made in 99 minutes, and the run to Pittsburgh (444 miles) was made without making a single stop. The average speed was 44 miles an hour between New York and Pittsburgh. The highest rate of speed was 62 miles an hour and the lowest 25, when the train crossed the railroad bridge at Harrisburg. The run from Jersey City to Chicago, a distance of 913 miles, was made in 20 hours and 57 minutes.

But the time on the eastern roads was no better than that which the train made over the North Western from Chicago to Omaha. In fact, it was not so good. Leaving Chicago at 10:30 p.m. it arrived at Clinton, on the west bank of the Mississippi, at 1 a.m., averaging a speed of 55 miles an hour, including stops, or of 58 miles an hour, deducting stops.

The average speed from Chicago to Omaha, including stops, was 45 miles an hour, or deducting stops, 48¾ miles an hour. The average speed from Jersey City to Omaha, including stops, was 42 miles an hour. During a considerable portion of the distance over the North Western the train passed through a heavy storm of rain, accompanied by lightning.

The entire run from Chicago to Omaha, 492 miles, was made in 11 hours and 1 minute. During the trip over the North Western one run of 75 miles in 80 minutes was made, and another of 45 miles in 44 minutes. The fastest time made on the entire route from the East was made on the North Western, in a short run of 2½ miles accomplished in two minutes.

The Union Pacific took the train and sped it onward at a rate of speed in advance of that laid down on the schedule. Between Omaha and Ogden engines were changed eight times, and some time was spent in repacking the hot boxes; but the entire distance, 1,032 miles, was passed over in 25 hours and 17 minutes. The fastest time from station to station was ten miles in 9 minutes.

From Ogden to San Francisco, over the Central Pacific, the time occupied was 23 hours and 52 minutes. Over this road difficulty was experienced from the brake shoes, and two other cars were put in to brake the train through the mountains. The train arrived in San Francisco in 26 minutes less than 84 hours absolute time. The arrival was greeted by the firing of guns. Not a single accident marred the trip at any point. Crowds of people greeted the voyagers as they flashed past the several stations, and at night bonfires illuminated their way in those portions which are thickly settled.

Such records and schedules are useful now, mostly as guides in still better work. Of course the train that could be taken over the old Union Pacific in 1876 at such high speed must have been carefully handled. Real railroaders must have had charge. If such speed could be made then, under such conditions, what might be done now, on the modern, highly standardized road we know in 1927?

Unlike the average mortal, railroad men seldom seek to make great speed unless a sincere purpose is to be served. When they hurry the reason usually is sound. There are traditions railroad men love, as there are in most trades or professions, but speed records must be authentic or they reject them. An unbelievable fish story they will credit, but not anything having to do with speed. It must be right. One such record, carefully authenticated, has to do with the fast run of a special train on the Lake Shore & Michigan Southern from Chicago to Buffalo in October, 1895. On that trip selected time-keepers and observers made the official record, so argument forever after was useless.

Engineer W. P. Johnson and Fireman T. N. Lowery, Southern Pacific-Rock Island Golden State Limited.

This Buffalo run is a classic. The train left One Hundredth street, Chicago, at 3:30 a.m. October 24, 1895, and arrived at Buffalo at 11:30:34 the same morning. The time-keepers made their own figures, took nothing from railroad men, and turned in their own report. One certain mile was run at the rate of 92.3 miles an hour. This table is interesting:

	miles an hour
1 mile at the rate of	92.3
8 miles, consecutive	85.44
33 miles, consecutive	80.66
85 miles, consecutive	72.98
181.5 miles, including stops	68.67
181.5 miles, deducting stops	69.67
289.3 miles, including stops	65.14
289.3 miles, deducting stops	66.68
422.7 miles, including stops	64.45
422.7 miles, deducting stops	65.89
510.1 miles, including stops	63.614
510.1 miles, deducting stops	65.073

Edward H. Harriman was taken from San Francisco to New York by special train, 3,255 miles in 1903, according to his own biography, in 71 hours and 27 minutes, an average speed being maintained the entire distance of 45.7 miles an hour. Over the Union Pacific he declared his train made 48 miles an hour west of Cheyenne, 55 miles an hour east of that point, and on some straight track 82 miles an hour. This smashed the Jarrett-Palmer record, and was sufficiently authentic to satisfy Mr. Harriman as it put him into a New York hospital in time for an operation which he deemed rather important to his peace of mind.

A nine-car silk train was reported last November by the Great Northern as having gone from Seattle to New York in 81 hours 41 minutes. This train was handled by the Great Northern to St. Paul, the Chicago, Great Western to Chicago, the Wabash to Buffalo, and the Delaware, Lackawanna & Western to New York. From Seattle to Chicago the time of this train of nine cars was reported to be 55 hours, thus setting a mark to observe in the future.

But all these trains, railroad men say very rightly, were special trains, moving under special orders, over clear tracks, under very particular operating conditions, and should not be confused with regular, every-day passenger trains carrying human beings in large number, all of them consumed with one laudable ambition to reach their destinations in one piece, and ready for service. The new 63-hour trains about which the country is talking today might be still further hastened, it is admitted, but could it be done with perfect safety?

After a journey on such a train one wonders whether anything has been forgotten. There are no

religious services on Sunday, but this seems to be the only thing we can dig up right now. You can have a bath whether you need it or not, and quite regardless of the day, Saturday or Monday. You can get your hair cut and have a shave. There's a tailor to press your clothes, men's or women's things, and there's a valet and a maid, white, and black, a beauty specialist is ready to restore the faded or jaded feminine traveler. There is music. There is a library, and a writing room, smoking compartments, the latest market reports and the most important sport news. There's an observation car, and up ahead there is a diner and a lounging car. On the Southern Pacific-Rock Island flier the locomotive is equipped with a sprinkler to prevent dust along the way. What more could the public demand?

The 63-hour trains are the Southern Pacific-Rock Island Golden State Limited, the Union Pacific-North Western Los Angeles Limited and the Overland Limited for San Francisco, and the Santa Fe's Chief. And they are very handsome, very thoroughly equipped trains, all of them, with comforts and conveniences unknown in the days of the Jarrett-Palmer special, or even on Edward Harriman's fast special.

What do these extra fare, extra fast trains cost, and what do they weigh—an important item to be considered in building and maintaining track and bridges. The Chicago & North Western-Union Pacific Los Angeles Limited and the Overland are good examples. That company's advertising manager in Chicago, who gives out such information when urged violently, says it requires six locomotives and eleven train crews to take these flyers over their 2261 mile routes, over eight states, across plains, mountains, rivers, and deserts. These all-steel trains, with everything that modern luxury can devise for the ease of its passengers, weigh about 1,500,000 pounds each if they leave Chicago as 7-car trains, but often they carry more cars. To maintain the service with eastbound and westbound trains departing daily seven Overlands move at one time on the rails between Chicago and San Francisco, and a like number in the Los Angeles Limited.

Both of these limited trains follow the route of the famous Overland Trail. This was successively the course of the Indians, Mormons, Forty-niners, prairie schooners, coaches, pony express, the first train across the continent, and now the air mail. While the first train over the tracks from Chicago to San Francisco in the 60's gave its passengers 106 hours of discomfort, the Overland carries passengers in comfort over the line in little more than half that time. But the path is essentially the same; the change has been in the mode of travel rather than in the route.

Getting down to figures it is found that a seven-car train weighs: Engine, 276,000 pounds; tender, 176,600; seven cars, 1,123,000 pounds; total for train 1,575,600 pounds. And the cost:

1 Locomotive	$ 70,000
1 Baggage Car	17,000
1 Diner	60,000
4 Standard Sleepers, @ $45,000.00	180,000
1 Observation sleeper	60,000
	$387,000
Seven Trains	$2,709,000

An advertisement boasting of "luxury" on its trains between New York and Chicago in 1879, on the "Chicago & Atlantic Railway" was reproduced in the Erie Railroad Magazine last October. The running time of the fastest west bound express in those days, the article says, was 36½ hours between New York and Chicago. The Erie, which is not a great passenger line, covers the distance now in 26 hours 10 minutes. The old advertisement declares the "sleeping, drawing-room and 'thoroughfare' coaches are simply models of elegance, and are lighted by the brilliant and marvelous Pintsch gaslight." And some gloomy persons still believe there is no romance in railroading!

Wheat Exports Increase

Average annual exports of wheat for the last three years—1923 to 1925, inclusive—amounted to 173,500,000 bushels, according to the bureau of railway economics. This is considerably greater than the annual average for any of the pre-war years from 1902 to 1913.

The wheat crop constitutes the largest single commodity of all agricultural products transported by rail in the United States. Wheat tonnage averaged about 27 per cent of the total tons of all agricultural commodities originating on the railways during the five years, 1921-1925.

International Business to Confer

More than 40 countries probably will have delegates in the convention of the International Chamber of Commerce, June 27 to July 2 at Stockholm. The United States will send about 200 delegates. The last previous meeting of the chamber was at Rome, four years ago. This is the program for the Stockholm convention:

Monday, June 27, 11 a. m., Opening session; 1:30 p. m. Trade Barriers, Bills of Exchange, Highway and Air Transportation; 4 p. m. Tea at the Royal Palace.

Tuesday, June 28, 10 a. m., Commercial Letters of Credit, Rail and Air Transportation, Protection of Patents and Trade Marks; 2:30 p. m., Trade Barriers, Double Taxation, Sea Transportation, Bills of Lading, International Arbitration.

Wednesday, June 29, 10 a. m., Trade Barriers, International Settlements, Communications, Enforcement of Foreign Judgments; 2:30 p. m., Trade Barriers; 7:45 p. m. Reception given by City of Stockholm.

Thursday, June 30, 10 a. m., Plenary session devoted to the economic situation of various countries; 2:30 p. m. Formal session of the Court of Arbitration.

Friday, July 1, 10 a. m., and 2:30 p. m., General sessions; 7:45 p. m. Dinner by Swedish National Committee to all delegates.

Saturday, July 2, General sessions.

Staying up all night may make you as wise as an owl—but owls have very little sense during the day.

Earned Less Than A Fair Return

Western Lines Failed By 20 Per Cent

By C. B. Fletcher

THE railroads made 5¼ per cent upon their investment account in 1926. Out of this they added to their surplus less than 1 per cent of their property value. Successful industries with which these results are reasonably comparable, realized from two to four times this amount, and after liberal distribution of dividends have added substantially to their surplus.

The effect of this condition is manifest in the relative standing of industrial, and of railroad securities in the estimation of the purchasing public, and the apparent preference for those of industry.

The railroads have all participated in the year's prosperity but not at all in an equal measure. In the eastern district the railroads earned 5.74 per cent or approximately what is regarded as a fair return. The traffic of the eastern district is more distinctly related to manufacturing industries than is the western or southern districts. In the East there seems to be more of a reciprocal feeling of mutual interest between the railroads and the industries they serve than is manifest in other parts of the country.

It seems that the protest against imaginary high freight rates in almost every instance originates at some point west of Chicago or the Mississippi River, or from some of the spokesmen for this territory, while our eastern friends seem to appreciate that they are well served at present rates.

The return realized by the western railroads was 4.57 per cent or 20 per cent less than a reasonable return. There is no reasonable basis for such a condition. The demands made upon the western railroads are more exacting than those in the East. The nature of the traffic is such as to require the very best of transportation service. California's fruits and vegetables, Washington's apples and Oregon's fruits are carried 3,000 miles to market and delivered in perfect condition. This service is the most exacting as to equipment, speed and safety, and its prompt and proper handling is one of the outstanding achievements of the age. The seasonal nature of this traffic is in itself a peculiar characteristic. While coal and ores and manufactured articles carried in the East have a seasonable nature it gives rise to no requirements which are comparable with the transportation of perishable commodities for such vast distances. Again, 50 tons of coal can be loaded into one car whereas 50 tons of livestock requires five cars, and 50 tons of fruits or vegetables require three or more cars.

The northwestern region has long been the restless district whence comes the agitation for lower freight rates on farm products. The return of the railroads in this district is 4.10 per cent or nearly 30 per cent below a reasonable return, and is the lowest return earned by any of the groups for which statistics are set up. This result is not at all complimentary to the northwestern region. It would seem that in a territory served so efficiently and at rates far below normal there would be an outstanding sentiment of appreciation for that service.

The facts are that the greatest financial tragedy connected with our western lines which marred the year's record for 1926 is associated with the northwestern region, and reflects vividly the adverse effect of the low rate level that exists in what is known as Western Trunk Line territory. The service statistics show that the railroads are waging a strong battle with the automobile. Passenger traffic statistics show that in the eastern district the traffic is less than one per cent. In the western district the passenger traffic declined in 1926 although that decline is less than one per cent.

Railway Taxes in the West

Most of the lingering complaint against freight rates comes from the western district, in which taxes in 1926 absorbed 6.7 per cent of gross and 26.3 per cent of net earnings. Subdividing this district, one finds that for the northwestern region taxes are 7 per cent of gross and 28.1 per cent of net; for the southwestern region the similar ratios are 4.9 per cent and a scant 20 per cent.—Wall Street Journal.

The S. D. & A. Deficit Grows

The only thing the San Diego & Arizona increased last year was the deficit, according to its annual report. This report discloses a net of $205,659 before the deduction of interest and amortization charges, but with those taken off a deficit of $858,832 is shown, which is a deficit increase of $124,494 over 1925. The road showed a decline in operating revenue, an increase in operating expenses, higher tax charges and lower non-operating income. The road had a lot of hard luck late in the year to add to operating expenses. Washouts put the property out of commission for a time.

Everywhere and Back by Motor

Safety and Low Cost the Aim

By Howard Kennedy

SOME of these days motor buses and airplanes will contain berths and dining arrangements," said a railroad man, a few years ago, viewing the growth of motor travel. The prophecy, just quoted, has been realized in all except one item: the motor buses, at least when this article was prepared, had not put on any sleeping cars. In every other respect the program has been filled, and if the motor industry continues to develop in the future as in the past, if the runs are lengthened as they seem likely to be, sleeping cars surely are not far away. Airplanes on some European lines already have sleeping berths, dining conveniences, and even a few motion picture entertainments. Just where and when the limit will be reached in providing such travel attractions no man can foresee. From a struggling infancy during which its products were declared by many never likely to be commercially important the motor business has become, in comparatively few years, a giant wielding an extremely significant influence in transportation, with such enormous amounts of money involved that some doubt exists as to its relative standing among the nation's great industrial affairs.

As might be expected, the inroads made by such an important competitor in transportation are causing the most serious study among men who provide money for such public undertakings. The question ceases to be merely one of passenger distribution. Wise railroad men have told me within the month that they are thinking only of the inevitable readjustments in American ideas of just what really is the demand, and how to meet it with due regard to the well known net return. "In the end," said one of these thoughtful railroad men, "the public will decide the question. In the end we shall have just as many steam and electric railroad facilities as the

Here's the Kitchen in A Pickwick Motor Stage, Coffee, Toast and Everything

public will support, and no more."

The automotive industry has its troubles just as other forms of transportation have theirs. The roads are not all smooth. Indeed, sometimes there are no roads at all. The public objects to the rates here and there, as it always will do. The schedules are wrong or the driver is reckless.

It is scarcely possible to go anywhere today and see no motor cars, and in most parts of America there are buses. For my own opinion which, however unimportant it may be, is based on observation in every state in the union, I do not believe these buses ever will affect seriously the long haul business of railroads, freight or passenger. So far as now seems humanly possible the bus promoters are doing all they can to enter and stay in that field. Flexibility of service impossible for railroads is, of course, the automotive industry's chief attraction. But I have not yet encountered any traveler who has made a round trip by motor bus from Chicago to the Pacific Coast. Doubtless there are such persons but they have evaded me. This, it should be understood is not said in an unfriendly way but only as a part of my study of this very important development in American transportation. I am not saying anything about preferences. I have traveled in airplanes, but I am not conscious of any overwhelming desire to go to Chicago or New York in one.

One sees today everywhere the most remarkable instances of motor car, bus and truck, passenger and freight development. Comforts undreamed of, except by thoughtful and speculative persons who had traveled about a good deal are now quite commonplace. No railroad coach ever had seats so soft. No railroad ever was able to deliver such a variety of scenery. Indeed some of these popular passenger buses now cost almost as much as the railroad coaches in which some of us traveled not very many years ago. An instance of very unusual development in this respect is seen in the properties of the Pickwick stages which run about everywhere, apparently, through Oregon, California, Arizona, New Mexico and Texas. The operation between Portland and San Francisco is over what is commonly known as the Shasta route. Operation is also conducted over the famous Redwood highway between San Francisco and the Oregon line. From San Francisco south to San Diego the cars go over the scenic coast route. Between Arizona and California coast points two routes are operated, one over the route into Los Angeles known as the Salton Sea route, and the other between El Centro and San Diego, both of which operate through the Imperial Valley. Two separate routes are operated entirely across Arizona. One from Yuma goes east, through Douglas. The northern route starts at Erinburg, goes east through Phoenix, and over the famous Apache route, via Globe and Duncan. Both the Arizona operations join at Lordsburg, N. M., and continue east to El Paso. The through routes, with the stub lines comprise 4,818 highway miles served, and on these highway miles there are 436 towns and communities.

The Pickwick company operates 300 buses covering 786,600 bus

And Here's the Stage, Going After the Passengers, Doubtless, and there Seems to be a Good Many of Them Nowadays for the Buses.

The Steward Seems to be Serving Something in a Bottle to the Diners

This is the A. C. F. Motor Coach with the New Elevated Observation Section for the Tourists

miles monthly. It has 17 garages besides using public garages for service at various points. Nine garages have fully equipped machine shops, and do major repair work. Seventeen tow or service cars are maintained at various points.

An operation so extensive as this requires several types and sizes of equipment. Buses range in size from 11-passenger, which are used in mountain regions, to 33-passenger capacity parlor car de luxe. The 11- and 14-passenger cars are 3-passenger wide body, standard tread, single tires; this type is used in the mountain regions where narrow roads and steep grades are encountered; the 22 - passenger aisle job is commonly known as parlor car type; the 33-passenger has side door entrance with five wide individual seats.

The parlor car buffet service seats 26 passengers. This is known as one and one - half deck job, and seats 12 on the upper and 14 on the lower deck. The observation car, which seats 22 passengers, has a special top developed and patented by the Pickwick Stages System, whereby the operator by turning a crank, folds the complete roof to the back of the bus over the baggage compartment. This may be done without stopping the bus, thus allowing clear vision overhead at all times. Such buses are used for special scenic routes. All these types are equipped with Pickwick individual adjusting seats with head rest. These special seats were developed and are manufactured in the Pickwick shops.

For two years the system has manufactured practically all of its new bus equipment. During 1927 a schedule is set for completing six buses monthly. The body frame, rear axle and side wheels are all manufactured in the Pickwick shops. Several different types of motors are used, but the Pierce - Arrow motor is far in the majority.

Here's a Close-up of the Same Coach in the Service of the Pacific-Northwest Traction Co.

Look at the Pickwick Hotel and Motor Terminal at San Diego, which Cost Half a Million Dollars.

Probably the most interesting part of any of the corporation is the personnel, or the human part, and upon its ability almost entirely depends the success to be obtained. By far the majority of the present personnel are men who have grown up with the bus industry, and have received

practically all their business training in this work. The company employs more than a thousand persons. A house organ is printed monthly, known as the "Pickwick Papers," through which the personnel describes all happenings of interest. A safety board is maintained to encourage and insure safe operation. A personnel welfare department is now being organized, whose duty it will be to look after the best interests of all employes.

Probably no one thing has contributed more to the popularity and rapid development of the Pickwick Stages System than its modern, conveniently located terminal buildings. Obviously, the selecting of locations, and the financing of properly placed terminal stations in cities of 100,000 or more, is one of the bus men's major problems. Vice President Morgan says he believes the Pickwick System probably has gone farther toward solving this problem than any other one operator in the country. To enable them to use property conveniently located for terminal purposes, where the value would not permit a small investment, hotel buildings have been constructed which have called for large investments. That at San Diego costing $500,000 is a fine example.

80,000 Buses in the U. S.

There were 79,806 buses in use in the United States on Jan. 1 last, as compared with 69,425 at the beginning of 1926 and 52,925 in 1925. The common carrier field claims the majority of the buses in use, the estimate for that group being 41,806 vehicles. Other operations, which include sightseeing and touring companies, schools, hotels and industrial uses, accounted for 38,000 buses.

The increase in the common carrier group, which shows a gain of 4,306 buses in 1926, was caused mostly by the rapid expansion in the number operated by two classes of carriers: the electric railways and the purely interstate operators. The trolley companies added slightly more than 2,000 buses to their equipment, and a comparatively small increase was made in the interstate carrier business.

The number of companies operating buses increased from 21,632 in 1925 to 21,908 at the end of 1926. According to classifications they are: Motor carriers, 6,911; electric railways and subsidiaries, 266; steam railroads and subsidiaries, 38; schools, 13,874; sightseeing companies, 334, and other uses, 485. Routes operated in 1926 amounted to 607,293 miles, as compared with 569,768 miles in 1925.

The capital invested in rolling stock in the bus industry amounts to 375 million dollars, a gain of more than 145 million dollars since 1925. The investment in terminals, garages, is estimated at 80 million dollars, making a grand total of 455 million dollars.

Gross revenues in the bus field amounted to 300 million dollars in 1926. Buses operating on city service routes carried 1,500 million passengers in 1926, and the average fare paid was close to 7.8 cents. In contrast with this city fare is the estimate of 33 cents as the average fare on intercity runs. It is estimated that 500 million passengers were carried in 1926 on intercity runs, the total revenue from passenger operations in this group approximating 176 million dollars.

Concentration

The power of concentration, the absolute necessity for specialized service, is seriously considered by the successful and almost always ignored by the unsuccessful or incapable. The disposition to do many things not so very well is a common fault of the failure. The experience of a goose will better explain my point in this fashion:

Once upon a time there was a goose that had the habit of laying its eggs in various places. This plan of wide distribution worked well until one day the old hissing sister wanted to set.

Few there are who have the faculty of doing many things well enough to compete with the specialist. They scatter too much. Better be a first class one thing than a second class everything.—The Silent Partner.

Happiness was never purchased; it must be worked for. And, remember, there is a great deal of difference between satisfaction and happiness.

A White Motor Bus Operating in New England

Opening The Oregon Forests

The Cascade Line Cost 40 Millions

By Edward Showalter

OREGON has long sought a second north and south line across its rich inland timber and grazing domains. Edward H. Harriman realized its importance even in his day for future construction. Dreaming over the details of his growing railroad empire while restingt at Pelican Bay Lodge, his beautiful retreat on Klamath Lake, the great builder saw that a large proportion of its inhabitants were settled west of the Cascades, and from Portland south in the valleys of the Willamette and Rogue Rivers, and in the territories surrounding Tillamook and Coos Bays. This region has long been served and dependent on the Southern Pacific's Shasta route, which with feeder lines operates through the entire country between San Francisco and Portland, and west of the Cascades. Until the construction of the new Cascade line all of that Oregon country east of the mountains and south of Bend has been isolated, untapped by the railroads. Population is sparse. In the center of it is the Crater Lake National Park. Surrounding it is the richest timber stand in America. South and east of Crater Lake is the Klamath River valley, rich in grazing lands. This territory which the new line, completed last August, will open to development, has but one city, Klamath Falls. And so, twenty years or more after he thought it out for himself, Harriman's dream has come to reality in one of the largest railroad construction projects in the West, a 280-mile line which is certain to add much to the traffic of the Southern Pacific Company in days to come. This line extends from Black Butte, Calif., on the Shasta route, northwesterly over the Cascade mountains to Eugene, Ore., where it joins the main line Shasta route. Construction began in 1909, and was twice delayed by litigation and the World War. Work on the last 118 miles was continuous after the autumn of 1923. The cost of the entire project will be approximately $40,000,000. The new track heretofore known as the Natron cutoff, has been named the Cascade line of the Shasta route.

The major purpose in constructing the Cascade line was to reach the large, undeveloped country and virgin timberland, and secure a direct railroad connection with the Willamette valley and Portland. Another reason was to create train operating advantages not possible over the Siskiyou mountains. The new line will not only benefit Klamath Falls, but the state as a whole will gain through the increased commerce and travel to be developed.

The state has long been noted for its lumber industries. It is estimated there are nearly 700 saw mills now producing an average yearly output of 3,000,000,000 feet of lumber. In Lane county it is estimated there are 63 billion feet of standing timber. Although Douglas fir predominates, there are also abundant stands of white pine, sugar pine, incense cedar and spruce. Some of the fir of this district attains heights varying from 200 to 300 feet. The state contains one-third of the nation's standing timber, and Lane county has more than any other

The Dreamer at Pelican Lodge

IF RESTFUL days ever entered the life of such a restless man as Edward H. Harriman they were spent in the quiet solitude of Pelican Bay Lodge, on Lake Klamath, Oregon. There he went occasionally when the heat and the hustle and the competition of congested cities drove him to seek seclusion from men and affairs. There he could choose his companions, almost an impossible thing in the business world where he was a dominant figure. There he could gather about him the congenial souls he liked, or he could roam the hills and the by-ways alone, to dream out his railroad kingdom as he wished. No other place, it is said, except home, ever was so dear to the great builder. Long after he had finished rehabilitating the Union Pacific Harriman spent part of a summer at Pelican Lodge, his only guest the poet and philosopher, John Muir. It was that summer Harriman conceived the Natron cut-off, now called the Cascade line, and traced its probable route on a map. The final building of this line was accomplished very much as he had dreamed it in his quiet days in the woods.

county in the state at present.

Agriculture will be benefited. With favorable markets there is always a large movement of live stock from Washington and Oregon points to the extensive grazing lands in the Klamath district. This movement had to be by way of Northern California through Weed. With the establishing of the new and more direct line, cattlemen can take advantage of markets in both San Francisco and Portland. It will put Klamath Falls 186 miles nearer Portland in the matter of freight rates. Also with the lessening of the distance to Portland there will be a relative decrease in the amount of loss incurred through shrinkage of cattle shipped to market. Other forms of agricultural activity in this district to be benefited by direct transportation service to Pacific Coast markets are hog raising, the growing of wheat, barley, oats, alfalfa, rye and mint.

The first work on the Cascade line began at Natron, Ore., in 1909; by May 1, 1912, 33 miles of track were laid as far as Oakridge. In July, 1911, work began at Klamath Falls, and the track was laid as far north as Chiloquin; by September, 1912, the railroad was pushed farther north until it reached Kirk, 40 miles from Klamath Falls. Work on the remaining 110-mile gap between Kirk and Oakridge was then stopped, chiefly on account of the litigation involved in the famous Central Pacific case, and also because of the World War. On September 1, 1923, work was resumed at Kirk and continued to the finish. The entire project has been under the supervision of George W. Boschke, chief engineer.

The Cascade line has operating advantages far superior to the present Shasta route, completed in 1887. The larger part of it is east of the Cascade range on a plateau higher than any of the summits of the old line. The plateau is so flat and level, however, that grades not exceeding 0.4 per cent were secured with relatively light construction. In addition to tapping a new country the line is shorter than the present Shasta line; it eliminates the equivalent of 51 circles traveled around the Shasta line because of necessary curves, and it will reduce the maximum grade rate from 174 feet to 95 feet to the mile. This will permit the railroad to operate trains between San Francisco and Portland with less motive power than is now required on the Shasta route.

The most difficult part of the construction work was on the west slope of the Cascades between Oakridge and the mountain summit. Here the maximum grade is 95 feet to the mile with the sharpest curves 8 degrees. The grade at the summit is 4842 feet above sea level. The canyon slopes in this section are steep and heavily wooded, and broken by shoulders and ravines. Some tunneling was required to reach the summit.

Recognizing the significance of the rail development, the people of the entire state joined in a two-day Trail to Rail celebration at Eugene, August 19-20. A pageant, "Klatawa," written by Prof. W. F. G. Thatcher of the University of Oregon, and a pioneer parade were presented. The pageant depicted the development of transportation from the time the principal of the wheel was first used and the coming of the white man into the rich wilderness of the Northwest. Ezra Meeker, pioneer, who

traveled over the Oregon Trail when a child, and other early settlers took prominent part in the celebration. State and city officials of the Northwest, members of the Interstate Commerce Commission, and railroad officials attended the celebration and big event.

Tourists traveling up or down the Pacific Coast may now have the choice of two routes of great scenic interest. The line might well be called "the line of the Lakes" as it brings within easy access to all passengers the numerous lakes which have always been isolated and surrounded by forest fastness. Of these, Odell, Crescent, Diamond, Crater, and the Klamath Lakes are noteworthy. The territory opened is rich in game, and is unrivaled in holding attention and enthusiasm.

Much Earth Was Moved in Cuts and Fills Before This Line Passed Through the Oregon Woods.

The track construction conforms to the high standard of the Southern Pacific. The ninety pound A.R.A. type A rail used throughout is laid on creosoted Douglas fir ties and equipped with tie plates. From Cascade Summit to Springfield Junction gravel is used for ballast. Between Cascade Summit and Grass Lake the ballast is volcanic cinder brought from a pit at Kegg, Cal., about forty-five miles north of Black Butte. The Black Butte line is ballasted with crushed rock. An unusual feature of the work was the fact that all main track and sidings, except the yard at Crescent Lake, were completed and blasted according to standard before the first schedule train passed over the line. It was possible to do this because the tunnels were the last items to be completed and time was given for full ballasting. Single track automatic signals were installed and placed in service in advance of regular train movement.

A district freight terminal has been established at Crescent Lake where the necessary yard tracks, engine handling, and other facilities are near-completion. The operation south of this point will be in charge of the Shasta division. The Port- assume jurisdiction north of Crescent Lake.

Harriman once expressed the cardinal principle of his philosophy when he told his chief engineer that "the only way to make a good property valuable is to put it in the best possible condition to do business." With Harriman, to put a property "in the best possible condition" meant lowering of grades, straightening of curves, rebuilding of bridges and finally re-equipping the line with new rolling stock.

Men and Mules and Machinery, and Forty Millions in Money Went Into the Shorter Route Across This Rich Domain.

Three Modern Railway Stations

Beauty and Utility

The Santa Fe's New Station at Riverside, Calif.

WHEN the average town or city decides that its entire future depends upon a new railroad station the impulse is selfish. How the structure is to be paid for is not a matter to be worried about, at least not by the town. What the people want is a station, not statistics about the net railway operating income, the increasing tax bill, wage demands and other troublesome and altogether irrelevant details.

The desire is perfectly proper. Everyone wants his town beautified. What the patriotic citizen overlooks, however, and apparently doesn't care to hear about, is the fact that a hundred other towns have precisely the same ambition as his, and intend to keep right after the railroads until the stations are built. At the same time, let everyone remember, rates certainly must be lowered. It is just as easy to convince the average commercial club that rates are far too low as it is to prove the railroad can not afford the new station.

The unpleasant truth is that few towns anywhere produce enough business to pay for the stations they demand. Such capital expenditures are made, in the final analysis, from rates and fares. There is no other source. No matter how much money a railroad borrows it must be paid back some day, and the intervening interest also, from rates and fares.

Which ought to convince any fair minded person that most of the great and beautiful stations all over this great and beautiful land are paid for by persons who live far away, and seldom see them.

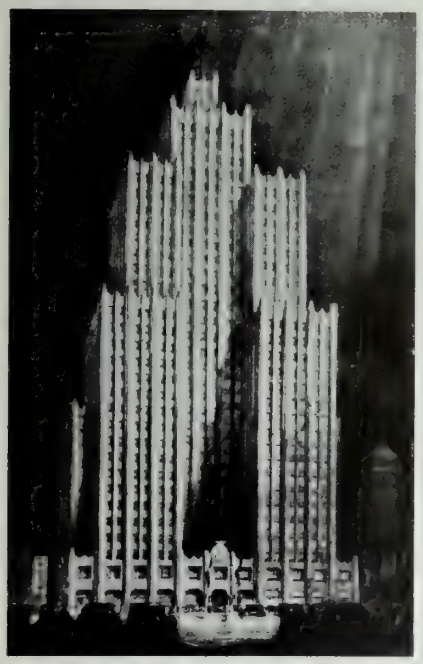
Santa Fe's Riverside Station

The new station of the Santa Fe System at Riverside fits beautifully into the atmosphere of the surrounding community with its Mission type of architecture. The station is complete in every detail, with full attention to the requirements for which it is designed. The dedication of the station was made a public event recently by the people and city officials of Riverside with a banquet in the evening attended by Santa Fe officials from Los Angeles and other cities.

Brownsville's New Station

The Missouri Pacific's new station at Brownsville, Texas, is directly in front of the old one which is to be used by the American Railway Express Co. It fronts 133 feet on Levee street with a stuccoed double train shed extending 600 feet from a 52 by 26 foot main concourse. Its typical Mission style of architecture with here and there a strong suggestion of the Moorish influence in that type of construction, is emphasized by the belfry and watch tower. The former is admittedly for decorative purposes and is surmounted with a blue tinted dome that does much to make the station appear like a bit of old Spain, set down in the midst of a bustling city. The watch tower effect is achieved by an original handling of the chim-

The Missouri Pacific's New Station at Brownsville, Texas, is a Combination Mission-Moorish Effect.



The Missouri Pacific General Office Building at St. Louis, Now Being Completed.

ney which runs through the roof from a massive fireplace in the main waiting room.

Here also the idea of the old Spanish mission is strongly in evidence but altered to meet modern needs. An artistically decorated beamed ceiling, with side walls of invitingly cool blended tints and tile trims all harmonize with the recessed and grilled windows and the heavy doorway. The floor is concrete and tile with a huge centerpiece of a bright colored star design that contrasts pleasingly with the original Aztec tiling that borders the open hearth. The ticket office and baggage room open into the main room while at either end is a smoking room, similarly finished and designed.

Apparently every thought possible has been given to making the station comfortable, attractive and pleasing.

Topeka's Handsome Station

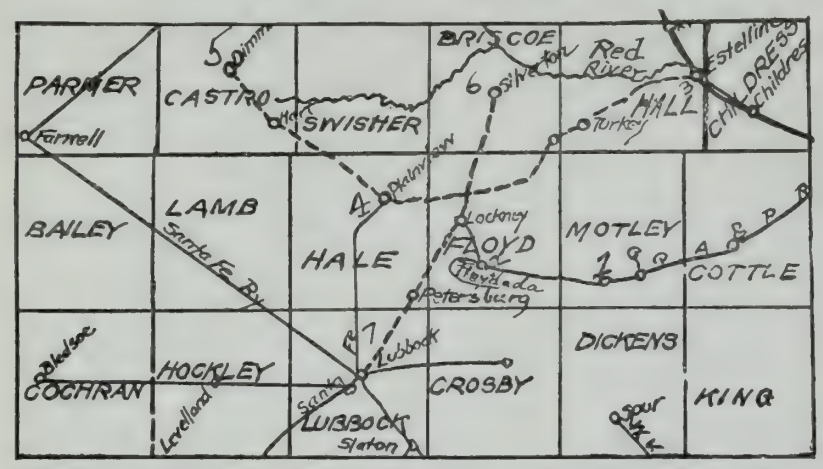
The first Union Pacific passenger train from Kansas City entered Topeka January 1, 1866. That is about 60 years ago. Far from the congested centers of population, in the towns and small cities, the relationship between the railroads and the people is intimate. Everyone knows the agent by his first name, and the division superintendent is the railroad itself whenever he appears in public. The president, usually, is merely a mythical character, seldom seen by ordinary mortals while the chairman of the board is entirely out of the picture.

But this hasn't been the story in the case of the people of Topeka versus the Union Pacific. True, there were times when the oldest inhabitant began to wonder whether he would live to see the new station about which people had been talking for many years. However, all things do come to those who stand and wait, and finally the Union Pacific built a handsome station for Topeka. In Chicago, the opening of a station costing $75,000,000 or more startled the newspapers into spreading the story over five or six columns. In Topeka, a town of 50,000, the papers got out four or five special sections, dug up the history of the whole works from the beginning down to the moment President Gray entered as the guest of the city; put on parades, luncheons, dinners, speeches — they are great talkers down there —more luncheons in the new station and more remarks; the original train of 60 years ago was there; the little old engine with its comical smokestack; Indians, early settlers, girls and hoopskirts and what not, all to celebrate the great day for the state capital. President Gray, accompanied by scads of officials, legal and operating and traffic, was on the job with a special train. There were welcomes here and there, and receptions, and just to make it a good one, more than 200 editors were in town from all over the state.

Steel Frame Going Up

Work on the new general office building for the Missouri Lines at St. Louis is progressing rapidly. This structure of which, for the present, only 22 floors will be built, will cost about two million dollars. The site lies along Thirteenth street, from Olive to Pine street and faces the Municipal Plaza, which forms one of the major projects under the $85,000,000 St. Louis municipal bond issue. The building will be in harmony with other buildings to be erected on the Plaza. The main structure will be 22 stories high, which is 250 feet above the street level, with set backs at the twelfth and eighteenth floors. It will be 100 feet on Olive street and 193 feet on Thirteenth street, with the foundation consisting of 76 piers resting on bed rock about 50 feet

The Union Pacific's Handsome New Station at Topeka, Kans., Opened Recently with Elaborate Ceremonies.



Burlington Construction in Northwestern Texas Costing Seven Million Dollars.

below the sidewalk. It has been designed to permit the addition of eight stories at some future time, which will make the main structure 334 feet high and the tower 432 feet high.

The volume of this building will be 3,618,750 cubic feet and the total floor area of 230,000 square feet available for office space, which is about 20 per cent more than the space now occupied by the Missouri Pacific in the Railway Exchange building. This floor area is equivalent to five city blocks or a concrete highway 2½ miles long. The exterior will be of gray limestone or pulsychrome terra cotta of cream tint.

The power plant will contain five boilers and three electric generators. Pneumatic tube system radiating from a central station will handle messages to all offices in the building. The ten elevators will be of the most modern type, each with a capacity of 22 persons and will operate at a speed of 750 feet a minute, controlled by automatic signal system, the operator registering the floor at which each passenger wishes to alight by pressing a button when the passenger enters the car.

The building will be occupied solely by Missouri Pacific Lines offices, excepting only the rooms on the ground floor. Entrances will be provided on three streets, the main corridor being on Thirteenth street intersecting the corridor running from Olive to Pine street.

Plans are also under consideration for an auditorium and rest rooms for use of employes, staff and Booster meetings, etc. Excavating for this building began last November. Steel is now being erected.

Construction in Texas

The Burlington and the Frisco lines are building 229 miles of track to serve the northwestern section of Texas. The cost will be about seven million dollars. The project will consist of 202 miles to be built by the Fort Worth & Denver City Ry., a subsidiary of the Colorado & Southern, which is in turn a subsidiary of the Burlington. The remainder, 27 miles, is authorized to be built by the St. Louis & San Francisco Ry.

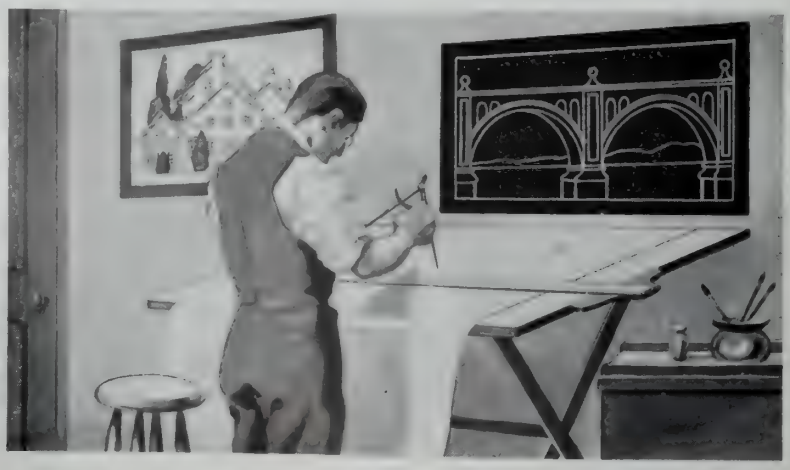
In the accompanying sketch the line between points 1 and 2 is the line that the St. L. & F. is authorized to build. Lines 3, 4, 5, and 6, 7, are the lines which the Burlington is constructing. The lines are to be ready for service by the end of 1928. The line between Plainview and Lubbock is expected to be ready by June, next year. The territory to be served is rich in agriculture, particularly corn and cotton.

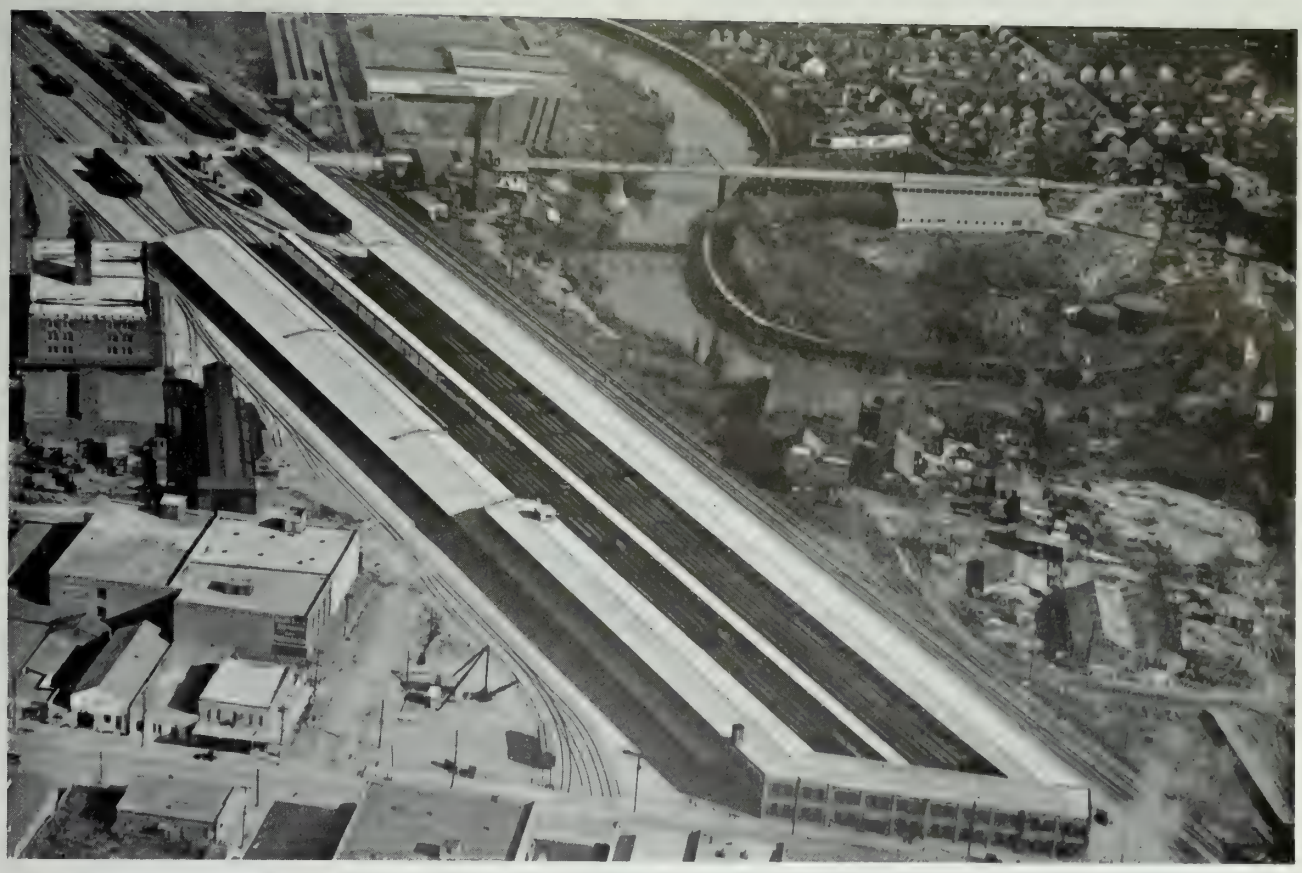
Word has come from the general offices of the Rock Island in Chicago that work will begin immediately on the construction of the line across the South Canadian river, north of Amarillo, Tex., into the oil fields north of the river, including the line to Stinnet, Tex. The work will be pushed as rapidly as conditions will permit, and will open the Amarillo-Liberal line north and west of Amarillo sixty miles. It is planned to reach Stinnett by June 30.

One of the important features of this extension will be the construction of a bridge over the South Canadian river, which will be one of the longest structures on the Rock Island.

The Amarillo-Liberal line of the Rock Island was started north out of Amarillo only a few months ago. It is believed it will result in an enormous development in the new oil territory, which is expected to be one of the largest fields in the southwest.

The Rock Island will spend more than a million dollars in double-track work, completing a stretch of 150 miles between Kansas City and Herington, Kansas.





The Houston and Dallas Terminals

S. P. Builds for the Future

NOT having any wizards on its engineering staff with ability to forecast the future accurately the Southern Pacific has done the best thing it could for the coming years in the fine terminal freight houses and team track layouts just built at Houston and Dallas. These cities have grown so rapidly that engineers and operating men are put to it to figure out their facility demands very far ahead, a disturbing feature of many American cities. Thirty-five years ago everyone in Houston or Dallas might have stood comfortably in such terminals as the Southern Pacific now has in those cities. Today, both are great industrial and financial centers of the Southwest demanding and urgently requiring the best transportation facilities possible for several large railroads to provide.

A special feature of the Houston freight terminal is an outbound house 28 by 1,140 feet in area consisting of an open platform protected by a wide over hanging roof. The total length of the inbound house is 1,120 feet divided into 20-foot bays, alternate bays being provided with sliding steel doors. The first 420 feet of this inbound house, extending from the headhouse, is a two-story structure. Each of the houses is served by a group of four tracks in the space between the two buildings. Between these two groups of tracks is a transfer platform 14 by 1,140 feet.

Other important features are the large amount of concrete roadways, an exceptionally high ratio of tailboard space to platform frontage, and a storage yard in connection with the team yard. The new terminal provides 137,750 square feet of floor space, with 28,000 feet of track, 45 turnouts, and tailboard space for 270 vehicles. There is loading space at the platforms for 208 cars. Inbound and outbound houses have concrete paved driveways 45 feet in width, running the full length of the houses. All platforms are of the filled-in type of monolithic concrete floor, and the entire building is equipped with an automatic sprinkler system.

The headhouse, fronting on San Jacinto street, is 41 feet 6 inches by 202 feet, two-story. All

of the two-story construction is reinforced concrete framed with steel roof trusses covered with corrugated asbestos roof covering. The walls are of brick. All one-story construction is steel frame with corrugated asbestos roof covering, and brick walls.

The two-story headhouse provides space for the agent's clerical and supervisory forces. In the basement is the boiler room and other heating equipment, with separate men's toilets and lockers for white and negro employes in the freight station. Toilet, wash and locker rooms for the clerical forces are on the second floor of the headhouse.

Driveways serving the two houses extend to the easterly end of the team yard, while two interior driveways, and two other driveways along three short spurs, give a total team track frontage of 141 cars. In the center of the team yard are four storage tracks with a total capacity of 92 cars and a runaround track. These storage tracks make it possible always to have cars ready for the inbound house, and any of the house tracks can be pulled and reset whenever the setting has been made empty, or loaded cars can be pulled from the outbound house and empties set to replace them. In doing this a runaround track and a special arrangement of ladders make it possible to do the switching without disturbing team track settings.

Work of clearing the site began late in February, 1926, and construction of the building the latter part of the following month. The only unusual condition in connection with the construction was the necessity for retaining the team tracks in service during building operations. This was accomplished by first constructing the outbound house during the period that team tracks were being provided elsewhere, a proceeding which slightly increased the cost but did not call for any unusual methods.

Design and supervision of the construction was handled by H. M. Lull, then chief engineer, now executive vice president of the Southern Pacific Lines. Dwight P. Robinson & Co. of New York City, were the general contractors. The entire project cost about $1,000,000.

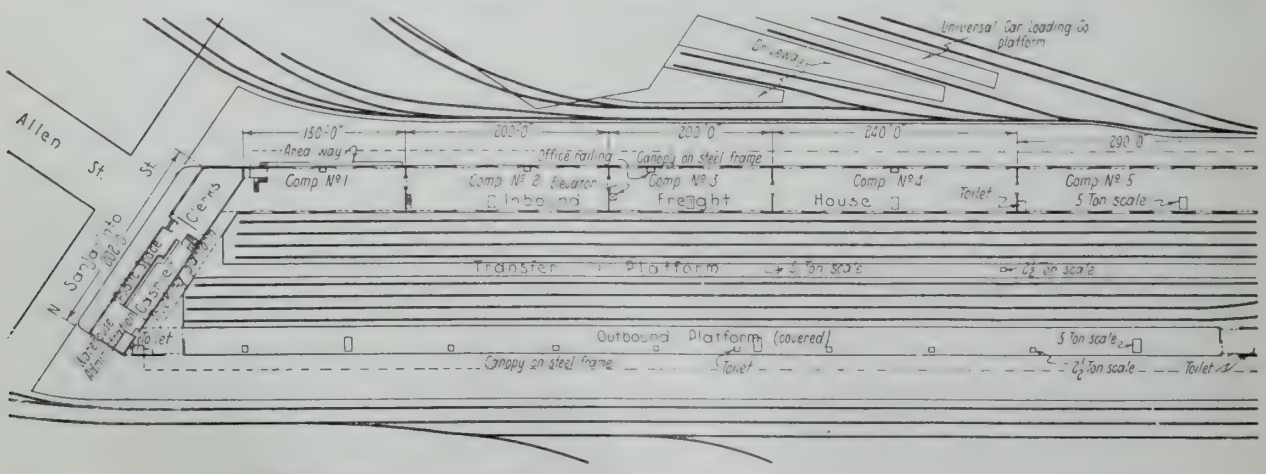
An important and very sensible departure in business management was the effort made by the railroad company to acquaint the shipping public with the facts about the new terminal. A booklet 9½ by 7 inches in size was issued containing a folding map of the entire Houston freight terminal and track layout. This map was 26 by 7 inches, large enough to show clearly all tracks, platforms, driveways and structures, with streets properly marked. It indicates also, by key letters, just where outbound freight will be received when destined to certain points, so that confusion and delay are avoided. In addition the booklet gives the names of all railroad department heads in Houston with room numbers and telephones, and other information likely to be needed by anyone interested in freight movements.

The terminal project at Dallas consists of a freight station and team tracks with auxiliary facilities in the area between Preston and Sherman streets and Canton and Aiken streets. Here the inbound house is 50 by 551 feet 7½ inches divided into three compartments having 20-foot bays. Alternate bays are provided with sliding steel doors, and an open platform at the south end 50 by 60 feet long.

The outbound house is 34 by 551 feet 7½ inches, with 34 by 60 feet open platform. The transfer shed is 14 by 611 feet 7½ inches long. All these are connected at the north end to the two-story (headhouse) office building, 42 by 184 feet 6 inches, of reinforced concrete construction.

The layout provides for 90 cars capacity at the platform and tailboard space for 140 vehicles. A storage and switching yard with a capacity equal to that of the house tracks is provided. The necessary switching and team tracks involve approximately 16,750 feet of track and 40 turnouts. The inbound and outbound houses have concrete asphalt paved driveways 61 feet 6 inches and 50 feet wide respectively.

All of the two-story office construction is reinforced concrete



Track Layout Surrounding the New S. P. Freight Terminal at Houston.

The Southern Pacific's New Freight Terminal at Houston, Texas

1, Freight House, Looking Southwest; 2, End of Outbound, Looking West; 3, Transfer Shed, Outbound on Left, Inbound on Right, Looking West; 4, End of Inbound, Looking West; 5, First Floor, Head House, Looking South; 6, Second Floor of Head House; 7, Head House and Outbound Shed.

frame with flat, concrete roof slab covered with composition felt roof. The walls are of brick on pile foundation. The one-story construction is steel frame with corrugated asbestos roof covering with brick walls. All platforms are of the filled-in type with monolithic concrete floor. The entire two-story office and inbound house is provided with an automatic sprinkler system.

The outbound house is open except for the panel at each end where left-over freight may be held. The project provides 15,500 square feet of office space and 61,250 square feet of freight handling space. The clearing of the property began in August, 1926, and construction of buildings about October 20. The buildings and equipment cost $470,000. The total cost of the project was about $645,000. A. M. Lull, now executive vice president at Houston, handled the design and supervision of construction. The Bellows-Maclay Construction Co. of Dallas was the general contractor.

BOOKS

Arc Welding, Instruction Manual. Lincoln Electric Co., Cleveland, publishers. Paper, 5 by 7½ inches, 92 illustrations. Price $1.

The book discusses, among other interesting and important subjects, high-speed steel welding; high pressure pipe welding; automobile frames; boiler repairs; welding cast iron; manganese steel welding; carbon arc welding and the manufacture of machinery and equipment, using welded steel in place of castings.

The Anthracite Railroads, by Jules Bogen. The Ronald Press, New York; 281 pages. Price $4.25.

This is a history of the Reading, the Delaware, Lakawanna & Western, the Lehigh Valley, the Central of New Jersey and the Delaware & Hudson treated as a unit. The effects upon the company of the economic and financial developments of the time are shown.

National Association of Railroad and Utilities Commissioners; proceedings of 38th annual convention, 1926. Published by the association, New York, 536 pages; price $5.

An extremely valuable volume for railroad and automotive officials. The book contains, in addition to reports and addresses, an address by Commissioner John J. Esch on "The Breadth of the Commerce Clause."

The Regulation of Security Issues by the Interstate Commerce Commission. By David Locklin, University of Illinois, 189 pages. Published by the university, Urbana, Ill. Price $1.50.

Benjamin Garver Lamme, Electrical Engineer, An Autobiography. Published by Putnam's, New York, 287 pages; price $3. Particularly interesting to those wishing the facts about the history of railroad electrification. Mr. Lamme designed the generating and motor equipment for the first big railway electrification in this country.

The Safety Appliance Laws, compiled by the Interstate Commerce Commission. Seventy-five pages and eighteen folding plates. Washington, Government Printing Office, price 50 cents. A truly pocket-sized edition containing the texts of the safety appliance laws, ash pan law, orders of the commission fixing safety appliance standards and plates illustrating these standards.

The Interstate Commerce Act, Revised to August, 1926; 330 pages, Washington, Government Printing Office, price 30 cents. Invaluable to anyone who needs to study railroad regulation. Published by the commission.

Great Lakes to Ocean Waterways, by E. S. Gregg and A. L. Cricher, 134 pages. Published by the department of commerce. Government Printing Office, Washington, price 25 cents.

Not So Much Stealing Now

Losses in 1926 due to robbery of freight while in transit on the railroads of this country were the smallest for any year since 1920 when the compilation of these figures began, according to reports just compiled by the protective section of the American Railway Association. Robbery losses in 1926 amounted to $1,314,501. This was a decrease of $177,942 or nearly 12 per cent below those for 1925, and a reduction of $11,412,446 below those for 1920, when robbery losses were the greatest for any one year in the history of the railroads.

"——That Night"

How's this for a motion picture scenario? A clerk for a Southwestern railroad was sitting peacefully at his work not long ago when a tornado struck the town and began to twist the buildings. The clerk extinguished all the kerosene lamps in the office to avert the possibility of fire. Then, when the storm had passed, he tried unsuccessfully to get in touch with the train dispatcher. The wires were down. Dashing one way along the track, he flagged a passenger train with a flashlight to prevent its being wrecked by obstructions on the rails. No sooner was that done than he had to race back up the track to flag a freight train from the other direction. Then he returned to his work.

Participation in politics is the duty of every citizen for the public good, as a public duty and a civic trust and not as a privileged business of the organized few.

Editorial Comment

The New Magazine

WITH this, our first issue of Transportation, we salute the great industry which our name typifies. The publisher and his staff are not new either to the game or the industry, but greet you in a new dress, a new form and a new style. To those who have worked with us and encouraged us by their cooperation, their money and their time that we might make this first issue as interesting as possible, we express our sincere appreciation. We hope that as time passes and history develops we shall have so aided the industry and those engaged in it that they may remember with pride the fact that they cooperated in making the beginning possible.

Many years ago we subscribed to the editorial policy, "To Think Clearly, Speak Plainly and Say the Thing that Ought to be Said." In this new paper we pledge ourselves again not only to carrying out this policy, but to following and renewing it more vigorously and effectively.

Our editorial independence shall not be affected by any monetary consideration but shall be tempered only by our wish to assist and serve by news dissemination and by discussion of the problems which we believe may develop progress in the science of transportation in all its phases. In pursuing this policy we shall endeavor to avoid carping criticism. At the same time we shall try to throw the light of day into questions affecting progress and development so that by creating new thought in the minds of the men in the industry we may assist in bringing about a still greater and higher degree of efficiency.

In our political and legislative policy we shall try to aid in extending the lines of steel and highways so as to bind together even more closely the widely different regions of our great nation and by the interchange of constructive expression to create thought and opinion strong enough to discourage restrictive legislation and excessive governmental regulation, which have done so much in past years to retard the proper development of transportation in this country.

If our efforts to accomplish these aims are not to be futile we shall have to depend upon the men who, as individuals, make up the transportation machine of the nation. Your cooperation can be given in many ways: first, by a thorough reading, not only of our illustrated and general articles, but also of the editorials; secondly, by sending freely your suggestions for bettering and developing the magazine. If you do not agree with what we say write us your views; if you agree with the policies we advocate tell us why. In other words consider this your paper a forum for the exchange of ideas which may be beneficial not only to yourself but to others.

Remember this is the first issue. If you like it, say so; if you do not, tell us why. We can not expect to achieve any great degree of perfection in the first number, but in order to adjust ourselves to the wishes of the industry your expressions are essential.

HAROLD A. SMITH.

Why Stop at Arthur?

We notice the Baltimore & Ohio is to paint its locomotives green and other colors, and name them for the Presidents of the United States, "stopping at President Arthur." Aren't there enough engines on the B. & O. to name one for President Wilson?

How About Colonel Cowan?

What will Colonel Cowan do now? The Interstate Commerce Commission says live stock rates are not unreasonably high, and the gentleman from Texas has devoted most of his life to trying to prove the exact opposite. Isn't it customary to have a writ or something of the kind at this stage of a case?

Common Sense

Railway and Marine News, at Seattle, gives shippers in the Northwest some pertinent advice. Writing, editorially, about "Full Crew" laws and similar legislation, that magazine says:

"Shippers and producers who are complaining of high rates and seeking reductions would do well to take these matters into consideration. We cannot hope to escape rate increases if by legislation we not only increase the cost of operation, but go further and cripple operating efficiency."

Here's a Fast Mail

In keeping with the spirit of the times the Great Northern Ry. advertises its No. 27, fast mail, between St. Paul and Spokane as "the fastest long distance train in the world." This train leaves St. Paul at 8:45 A.M. and arrives in Spokane at 6:15 the following evening; running time 35½ hours for 1456 miles. This is at the rate of 41 miles an hour. A rather careful investigation of all the schedules indicates that this advertising is truthful. If the Great Northern can run 41 miles an hour for 1456 miles that speed can be maintained safely for 2,000 or 3,000 miles under equal operating conditions. Such

a schedule would mean 56 hours and 50 minutes, a saving of six hours, off the present extra fare limited trains between Chicago and the coast.

Looking Forward

There is a greater tendency among railroad men today than ever to consider future traffic conditions in developing their plans and designs for new equipment. A striking example of this is found in the new suburban coaches which the Chicago & North Western Ry. has ordered recently. These cars are made to afford the best ventilation and comfort for commuters, and the vestibules may be operated with high or low platforms. The design also provides for either steam or electric operation.

Making Life Brighter

The Hepburn law deprived the editor of several very important prerequisites in the railroad field. But something happens once in a while to dispel the gloom. One of the waitresses in a Pacific Electric lunchroom handed the editor his check, a few days ago. The amount seemed small, and the editor called the girl's attention to it—not wishing, of course, to short-change a large corporation. The waitress gave the editor a glance, and handed back the check. "Coffee," she said, languidly, "is only five cents for railroad men."

The Demand for Stations

When a town makes up its collective mind to demand a new station the commercial club should assemble the people and discuss seriously one question, "Can we — not the railroad — afford to spend the money?"

Did you ever hear of a town doing this? A station is a capital expenditure, in accounting language, but the money comes from rates, and rates come from the pockets of the people. You can not compel the government, state or national, or the railroads, to spend a dollar unless you, the people, provide the money. Few persons seem to know this.

The Comedy of Figures

Not long ago Dwight Davis, secretary of war, said that although a billion and a quarter dollars have been spent by the federal government upon the improvement of the harbors and waterways, the savings returned to the people by the reduced transportation costs are equal to 500 million dollars annually.

"This dividend of over 33 per cent on the investment annually in savings demonstrates the soundness of this plan," the secretary concluded, blandly, rubbing his hands together in wrapt contemplation of this government thrift.

Can you beat it? The energetic fictionists now selling rabbit ranches in some parts of the world are tyros compared with some of these industrial and political dreamers. These are in a class with General What'shisname who gets up the glowing reports showing how many millions in freight charges have been saved for the people bv the government's Mississippi-Warrior River barges. But these savings, like life insurance, you pay for but never see in this world.

Crazy Valuations

The book investment of the Northwestern Pacific is $65,984,000. Its capitalization is about three millions less. The Interstate Commerce Commission values the road, for rate making purposes, at only $35,595,000. This means governmental destruction of nearly 28 million dollars invested in the property. That is to say the government values the road as of June, 1916, and proposes to base rates on the figures obtained. The late Senator LaFollette certainly did leave something behind him long to be remembered.

For Five Generations—Tanks

Not many trade communications come to editors' desks warranting a special paragraph, a headline, and a separate position to distinguish them from other notices received in the morning's mail. But here comes the engraved announcement of the W. B. Scaife & Sons Co. of Pittsburgh and Oakmont, Pa., New York and Chicago to tell the world that for 125 years that firm has been in the prosaic business of making steel tanks of one kind or another. Interesting enough in itself, but the really human part of the story is found in two signatures, "J. V. Scaife, president, fourth generation, A. M. Scaife, vice-president, fifth generation."

What has been the special thrill in tank making that has kept five generations of this family true to its traditions? How many fathers in this young republic have made such a record? How many firms of any kind are there in the United States with 125 years of family unity behind them? Surely the Scaifes of Pennsylvania have demonstrated in a very commendable way the importance attaching to a life having one fixed purpose, of liking your job and doing it in the best possible way!

Law and Common Sense

It is admittedly a matter calling for some assurance for a layman to express opinions of the law contrary to the highest tribunal in the land. But to this layman there is great difficulty in reconciling the attitude of the Supreme Court toward public utilities serving several million people with its attitude toward the larger utilities, such as railroads, serving 115,000,000. The layman finds it difficult, also, to understand why, if a recapture clause is constitutional when applied to railroads it should not also be applied to the excess earnings of public utilities whose net return, the court

has held, is not at all unreasonable when it reaches 7 or even 8 per cent. Of course, there is no law requiring the recapture of excess earnings of public utilities other than railroads, and this is one reason why the layman has been led to believe that the railroads owners are not getting a square deal, which all of us have come to believe is assured in this country.

Radio Beacon In Use

Reports of things done in the air nowdays must give Jules Verne many a thrill if, perchance, he happens to be where such news penetrates. Here comes Parker Van Zandt of the Stout Air Services, Inc., first to report the successful use of the radio beacon. Excellent reception has been had over the entire route, which is 142 miles long. Pilots have flown quite easily by means of the beacon. WKAR, a broadcasting station at Lansing, has been used as the transmitting station for weather reports and special services. When the plane passes over Lansing, which is midway between Detroit and Grand Rapids, a message is broadcast which is received at both terminals of the line, and is delivered through loud-speakers at the waiting rooms. This message states that the plane has just passed Lansing and will reach its terminal at a certain time. Communication with the plane is had by means of this station, and this method of communication has interested numerous listeners in the subject of aeronautics. WKAR has instructions to warn the plane in case it is heading into bad weather, so that it may turn back and land safely. This is an instance of the value of radio stations in dispatching planes. Probably such service will be common in the near future.

Public Ownership Fails

Municipal ownership of public utilities, which is the galley-proof of government ownership, seems to be falling to pieces. Harper Leech, the political economist of the Chicago Tribune, says municipal light plants which are not quitting are quite generally becoming power customers of the big private generating plants. This really is the heart of the problem of public ownership. If such ownership might be expected to succeed anywhere it would be in the operating of great generating stations. Private and public ownership had practically an equal start in the electric industry. Public ownership had the advantage of cheaper capital, lower tax burdens, and political favor.

But public ownership has failed. "It lacked imagination, foresight and courage," Mr. Leech declares. "The private companies flashed past the municipal plants like a pay train passing a hobo. Still the politician will try to hold on to the distributing systems as long as possible. Jobs are there—clerical jobs, so dear to the political machine; contacts with the voters are involved.

"So we find that, in Wisconsin, of 115 municipal plants in operation at one time or another between 1891 and 1926, 26 have gone the whole route from public to private ownership and 89 remain public, but of that 89 only 14 generate all their juice, 12 generate part of the current they sell, and 63 purchase all their current from private stations. In Massachusetts 31 out of 42 publicly owned plants buy all their current, and none of the other 11 is self-sufficing.

"Eight municipal plants in Louisiana and 15 in Mississippi were sold to private companies last year."

The Value of Transportation

It is difficult to estimate or fully to comprehend, the actual economic value of railroad transportation to the people of the United States.

The natural process of determining relative value is by comparison. Probably the most liberal comparison that can be drawn is to consider present day railroad freight service with an original form of transportation. Throughout a large part of China, the coolie is the only transportation facility available for service between communities, and these communities are mostly small because of this condition.

One Chinese coolie carrying 166 lbs. of freight, three miles an hour, eight hours a day performs an equivalent of 4,000 lbs. carried one mile, or translating this into railroad statistics of the day, it is equivalent to two tons, one mile.

One American train of 600 tons, making ten miles an hour, eight hours a day equals 48.000 tons one mile. It will be seen that one American train in eight hours performs transportation service equivalent to that of 24,000 Chinese coolies for the same period of time. This is one of the great differences between China and the United States. Several years ago China suffered from a food famine, owing to the failure of crops in one certain section. One reason there was no surplus in China was because a great part of the country devoted to agricultural purposes is devoid of transportation other than the Chinese coolie It is, therefore, useless for a Chinese farmer to raise more than he can use and dispose of in the local community. Hence, there was no great reserve available to the famine stricken districts.

This country is so well provided with transportation that the people have become accustomed to taking all this for granted. It is clear, however, that instead of talking about high freight rates they should be grateful for the extremely low freight rates, and correspondingly loud in their praise of the means of railroad transportation at their command.

How Far Shall Diners Be Run?

The order of the day seems to be the development of through and long runs. There is no question of the possibilities which have been proved in the increased locomotive runs; there is no question of the economy and necessity of the through sleeper. But with these seems to have come a tendency on the part of the railroads to increase the runs of the diner, and we wonder whether careful consideration has been given to all the problems resulting.

There are now some cases where diners have been carried on through trains for nearly 2,500 miles. One railroad folder states the dining car kitchen, 6 feet, 8 inches by 16 feet, is scientifically arranged not only for preparing meals but for storing perishables, linen and equipment; that the road serves on one run of this diner 1,466 meals; that 21,840 dishes are washed; that over 2,000 pieces of linen are required for a single run. Can you conceive some of the problems of the crew of the diner in handling more than 1,400 meals, taking care of the supplies and equipment, washing dishes in a space 6 feet, 8 inches by 16 feet, especially when you remember that this is done almost as a steady and continuous performance, and that because of changes in altitude and climate such a run encounters practically all the extremes of temperature.

Better service, more equable conditions for the steward and help can be developed by reducing rather than by increasing the length of the dining car run. The problem of climate should have an important influence in determining the question. Regardless of the steward, a sick chef with a broken down morale in the 6 by 16 space cannot be productive at all times of the best service.

What One Filibuster Did

The filibuster which prolonged the closing days of the United States senate resulted, among other things, in preventing consideration of Senator Pittman's bill to relieve certain short line railroads from the onerous provisions of the recapture clause of the Transportation Act. This bill should have been passed. The senate committee on interstate commerce reported favorably on the measure and it was placed on the senate calendar, but about that time Senator Reed of Missouri decided to take charge of things and his decision, doubtless, has caused some short line railroads a great deal of financial embarrassment, or will cause it before another year is finished.

The committee report was interesting. The proposed exemption, the report explained, was limited to short line roads because such lines, "serve a limited area and are dependent for transportation upon a small variety of products. They are therefore subject to the misfortunes which befall such products by reason of acts of God or market conditions. They are subject to peak conditions. For several years such a road may suffer an operating deficit, and then for two or three years it may make a net operating railroad revenue in excess of a fair return on its railroad property. Under the present law no part of such excess can be applied to the prior losses.

"There are 600 such short-line railroads and their investigation and administration under the so-called recapture clause imposes an unnecessary and unprofitable burden upon the Interstate Commerce Commission and other administrative forces of the government.

"The failure to grant the relief provided for in the bill will result in the bankruptcy and destruction of many short-line railroads"

None of which seemed to worry the senator from Missouri.

Track Construction Grows

For the first time in ten years track construction is overtaking track abandonment. In 1925 the Interstate Commerce Commission authorized the construction of more than 1,000 miles of track, but in the same year 745 miles were abandoned. Construction of new lines was 35 per cent greater in 1926 than in the previous year, exceeding 1,000 miles for the first time since 1916. This activity is continuing in 1927, an extremely hopeful sign because track in these competitive days is not built without a great deal of careful investigation. Heavier rail was used last year and is being used now, some roads adopting the 110-pound rail instead of the 90.

Some of the more important construction this year is going on in Texas and other western states. The Frisco will spend nearly $10,000,000 for a connection between its line near Birmingham and the Muscle Shoals & Pensacola line recently acquired. The Burlington, through its subsidiary, the Colorado & Southern, is building 200 miles of line in Texas to cost about $6,000,000. In Montana the Northern Pacific and the Great Northern will spend more than $1,000,000 for extensions. The Southern Pacific is spending $1,500,000 for two short lines, and the Denver & Rio Grande Western will spend about $500,000 in Colorado for track. Construction of 29.22 miles of main line track on the Missouri Pacific Lines between St. Louis and Jefferson City, Mo., is embodied in the program to double-track the right-of-way across Missouri. The work this year will entail an expenditure of $3,400,000. The Chicago & North Western is to build 100 miles of second track while at the same time spending other millions for yards.

A Friendlier Public

One of the best evidences of a new friendliness for railroads is found in the participation of the people and the public officials they have elected in demonstrations to mark certain anniversaries. Several of these have been recorded in the last few weeks.

In February the citizens of Cheyenne, assisted by several nearby towns, celebrated the 60th anniversary of the entrance of the Union Pacific into that thriving city. The people and the railroad cooperated in making this an occasion long to be remembered. The Wyoming State Tribune published a special historical edition, wonderfully written and doubtless the work of months, well worth reading and filing for the future. In March, Oklahoma City and other towns along the line joined St. Louis & San Francisco officials and employes in celebrating the 25th anniversary trip of the Meteor, the Frisco's fast train between St. Louis and Oklahoma City.

These things are much more important than some persons may imagine. They are educational in reminding the thoughtless, and especially the rising generation, of the very great blessing the public in America has in its railroad service. They are the best possible form of public relations work, and well worth every dollar spent and all the efforts made to carry them to successful conclusions. This point is brought out clearly by the Wyoming State Tribune when it says in an editorial, "Few Cheyennites, perhaps, fully appreciate the importance of the Union Pacific railroad in their community economics. This applies especially to the younger generation, 'younger' in this usage including those young in years and those whose residence here is of comparatively recent origin. There is a general disposition to take the Union Pacific for granted, and therefore to give no thought to its influence in the community's solidarity, substantiality and prosperity. * * 'Tis so frequently, with good fortune—the observer better is able to appreciate it than is the beneficiary."

Cheyenne is a city of 17,000 population. The Tribune says the Union Pacific is responsible for at least 12,000 of this number, by reason of the many businesses, professional and commercial, brought into existence through the necessities of nearly 2,000 employes of the railroad living there. Figured this way, which is the right way, it is not difficult to understand why railroads are overwhelmingly important wherever they go.

A New Speed Advocate

President Adams, the new chief executive of the Western Pacific R.R. says his line will use the Moffett tunnel and cut 175 miles from the distance between San Francisco and Denver. Mr. Adams says his line intends to make the time between Chicago and the Pacific Coast the fastest on any road.

This is the proper spirit. The new tunnel, which is 50 miles west of Denver, will be open for trains about July 1, and a number of very important changes in schedules may result. Plans for the Dotsero cut-off, a 45-miles extension connecting the Denver & Salt Lake R.R. with the Denver & Rio Grande Western, have been submitted to the Interstate Commerce Commission for approval. With this little line completed the so-called James roads, which include the Burlington, the Denver & Rio Grande Western, and the Western Pacific, will come into rather lively competition for transcontinental traffic. Indeed, it is more than likely that the Moffet tunnel and the Dotsero cut-off may result immediately, in further shortening the time between New York and the Pacific Coast to three days.

Airplanes are taking mail and express from the coast to Chicago in 20 hours and to New York in 30. While not many persons are eager to travel quite that fast there is, of course, no way of determining how much speed the rising generation is likely to demand. No form of transportation yet devised has proved quite fast enough for this energetic America. Furthermore, most men familiar with railroad operation, and with the very excellent roadbed conditions of most of the transcontinental lines, know that a good many hours can be cut safely from the present 63-hour schedule between Chicago and the coast. Life is so short, anyway, said Victor Hugo, that we shouldn't make it still shorter by wasting any of it.

Car Building Readjustment

The freight car building industry seems to be struggling with the old malady of excess capacity which has been increasing steadily during recent years, with a corresponding decrease in the purchase of freight cars until the gap is becoming wider and wider. Records show that approximately only 91,600 freight cars were turned out by the builders during 1926, and that the average number of cars built during the past three years has only slightly exceeded 105,000. This has been due to several conditions: first, the increased capacity of the cars built in recent years; second, the increased loadings and third, the fact that we have only recently reached the point where the life of the steel car has been determinable. At the same time the earlier cars have proved what can be done to increase their life by reconstruction.

On the other hand, some of the older plants have not only revamped their manufacturing facilities, but to a certain extent have increased their capacity. Quite a number of companies during the war developed facilities for manufacturing munitions, which since have been found adaptable to car construction. tion.

Rather than let this industry continue under false it seems plausible that money can be saved by divert-estimates of the car building demands of the country, ing some of the capacity to other lines of production. In scattered instances we find some effort being made to do this. Possibly the development of a policy by the railroads to stabilize car purchases would, in effect, produce a quicker adjustment. A railroad company should be able to estimate very definitely in advance at least its car replacement schedules. Plac-

ing orders for cars on an annual basis to meet replacements would make it possible for the car builders to so adjust their schedules and capacity as to work not only to the benefit of the car building industry, but at the same time make it possible for the car builder to produce better cars, and at a lower price to the railroads. This stabilization and reduction in price should make it more interesting also to roads who are attempting to construct their own cars, and make more accurate comparisons of cost possible.

We believe the whole problem of freight car construction is so important to the industry that we invite discussion of the question in our columns. We shall be glad to hear not only from the car builders, but also from railroad men in this connection.

Commercial Ambassadors

In a recent gathering of railroad men one of the speakers, in an effort to be facetious, proposed a conundrum: "Why are railway supply salesmen like apple pie?" The answer to this moth-eaten old timer, as many readers know, doubtless, is "just enough crust and plenty of applesauce."

One of the older members of the fraternity, replied saying he took no offense at the humor in the answer but that he certainly took issue on the use of the term "railway supply salesmen." He preferred, he said, to dignify the profession with the title, "commercial ambassadors."

We have met the applesauce salesman. Unfortunately there are quite a number of them, but surely a great share of the men engaged in the industry are more properly entitled to be classified as ambassadors. They have spent their money, their time and their brains, not only to achieve commercial advancement, but have gone further in this industry. They have worked sincerely to assist the railroads to develop equipment and machinery which has increased efficiency and made possible the modern railroad as we see it today. Surely when we think of the men who pioneered, and gave their best efforts, their life and their energy that this industry might advance, men such as George Basford, we can deeply realize how fitting the title of ambassador might be. There are today just as many men of the younger generation working in the industry whose aims cannot be classified as selfish, who would scarcely fit into the applesauce class.

But Still They Try

With fortitude and persistence certain to be invaluable if turned to the proper uses, motorists continued throughout the past year, as they are doing in 1927 for that matter, to argue with locomotives at grade crossings. Speaking before a convention of life insurance presidents, not long ago, Henry S. Nollen, president of the Equitable Life Insurance Co., said more deaths had been caused by automobiles within the last two years in the United States than occurred in action on the battlefront in the great war, among the American troops; more than four times the number of deaths caused by typhoid, which has been a matter of general concern for many years. Automobile fatalities were approximately one-fifth of those caused by tuberculosis in 1926 and about two-thirds of the volume of deaths due to influenza, Mr. Nollen said.

What's to be done about it? Men otherwise quite normal, ordinary, prosaic creatures in their every day relationships seem to change utterly the moment their hands grasp a steering wheel. With all they hold dear in this world in the seat behind them some men become speed demons, stubborn road hogs, discourteous, defiant dare-devils while driving an automobile. In Chicago and Cook county alone, last year, nearly 800 persons were killed in automobile accidents or died from injuries so received.

But don't blame the poor motorists for all this slaughter. Not all the fault is theirs. If there is any value in vital statistics about two-thirds of the pedestrians roaming around the city streets ought to be under restraint. The pedestrian has no more chance to win against an automobile than the motorist has of beating a locomotive and train.

The Safety Council report for 1926 showed that three-fourths of the automobile accidents were caused by violation of law and rules of the road. Disregard of right of way, speed, and failing to signal are leading offenses. Evidently, law does not work reform.

What to do? The life insurance gentleman referred to has the answer. "Manifestly," says President Nollen, "the remedy lies wholly in arousing a sense of moral and social responsibility in every individual—pedestrian as well as driver."

There you are.

Discussions in Advance, Too

Discussions in conventions or club meetings might be made to serve more important purposes by just a little forehanded preparation. This preparation would be particularly easy in the case of most conventions for which the committee reports usually are prepared and distributed in advance. Indiscriminate and extemporaneous discussion usually is a waste of time and words. Seldom does anyone know who is doing the talking, and very few know what is said, chiefly because the average speaker, rising from his chair, faces the presiding officer instead of going to a position in front of him or to the platform and facing the audience, as he should be required to do. All these irritating features might be eliminated by designating certain persons to discuss the papers, printing the discussions in advance and then seeing to it that the speakers chosen face the convention when they read. It might be worth while, also, to suggest that they discard chewing gum and cigars while talking. Such a plan would produce more valuable information.

The Editorial of This Edition

THERE is just one way for railroads to overtake and check the constantly mounting costs of producing transportation, the only thing they have to sell. This is by using the most modern equipment, machinery, or devices to reduce manual labor, save time which is money, and to haul faster, heavier and longer trains with less fuel. Personnel is important, of course, but personnel without modern methods and modern equipment can not produce efficiency.

With their present establishment the railroads seem to have arrived close to the peak of efficiency. This is indicated pretty definitely in the reduction, in 1926, of the operating ratio to 73.1 per cent. In 1920, due to the period of government control, the operating ratio had risen to 93.7 per cent.

The degree of efficiency attained by the railroads is not open to argument, but neither is the fact that something still further must be done. Writing, recently, about the railway performance in 1926, Dr. Julius H. Parmelee, director of the bureau of railway economics, said, "There can be no compromise with the problem of efficiency. This problem always is present, in good times and bad. No person or organization ever attains perfection, and too great a satisfaction with current performance is a danger signal."

The need for still greater efforts in the direction indicated is shown in the railway figures for last year. Class 1 roads in 1926 had an operating revenue of $6,449,000,000, an increase of 4.2 per cent over 1925. These revenues were greater in 1926 than in any previous year notwithstanding the fact that passenger and mail revenues declined. There was, however, an increase of 7 per cent in freight ton-miles. The operating expenses in 1926 were $4,715,000,000, an increase of 2.9 per cent over the previous year. While these operating expenses were less than in 1923 and 1920, they were greater than in any other year except those two.

The net railway operating income in 1926 amounted to $1,232,000,000, an increase of 8.2 per cent over 1925. This was a greater net railway operating income than had ever been recorded but the rate of return on the investment was only 5.13 per cent. In part this was due to a largely increased investment and a schedule of rates which had not been increased accordingly. In the western district the rate of return on the investment was only 4.45 per cent.

Against these increased earnings and increased net railway operating income must be placed the largely increased labor bill, which is likely to grow to even higher figures because of continued demands for wage increases. A rapidly growing freight traffic calls for more employes. With that increased traffic, handled by an increased personnel receiving higher and higher wages for transporting commodities moving under rates which have not been increased, stock holders are confronted with the vanishing net return. In 1925 Class 1 roads had 1,769,099 employes. In 1926 there was an average of 1,773,864, an increase of 36,000 necessary, of course, because of increased freight traffic. The aggregate compensation of these employes in 1926 was $2,990,000,000, an increase of $90,000,000 over 1925. The average compensation per employe was greater last year than in 1925. Various adjustments made it possible for the average railway employe in 1926 to earn an aggregate compensation of $1,656, compared with $1,639 in 1926, and $1,613 in 1924. Dr. Parmelee's report for 1926 shows clearly that every class of railway employes paid on an hourly basis improved its position as regards earnings by the hour during the last three years. While the increases were relatively small in 1925 and 1926 they were cumulative. An increase from 1924 to 1926 of 1.3 cents an hour may look small, but when applied to a total of four billion man-hours the result is a payroll increase of more than $40,000,000. Consider then, that some of the classes are asking 7 or 8 cents an hour increase and some idea may be gained of what the railroads are facing.

Too few men are mentally equipped to distinguish accurately between economy and stinginess. Too few realize that the wise spending of money means spending at the right time for purposes certain to produce more money. Many bankers will not lend money to farmers, for example, unless satisfied that it is to be used for some productive purpose. The head of one of the nation's largest industrial corporations declared, not long ago, that the highly creditable record it had made never could have been achieved if it had not discarded several million dollars' worth of obsolete equipment in its various plants.

With passenger revenues falling constantly—they decreased $13,000,000 in 1926—freight traffic, calling for more service, increasing constantly; wages increasing, and taxes, due to state extravagance, already amounting to $400,000,000 a year; rates remaining stationary; the rate of return based on wholly unfair valuations, something obviously must be done if railroads and the men who own them are to receive a fair reward. Dividends already are many millions of dollars less than the taxes.

The country continues to demand still lower rates, and more and better transportation. The only way to meet the demand is to produce transportation at a lower cost, and the only way to do this is by stil more scientific and modern means, which of course calls for the best there is in up-to-the-minute equipment.

One very effective means of economy and efficiency is found in power, locomotive design. Obsolete engines used for switching are a loss, but very large and important railroads are using them. These old engines in switching service are just about as ef-

fective as cutting the grass in a public park with a hand lawnmower, and this is no longer done. Thoroughly modern locomotive design and fuel economy go together, and both are very important.

Why Not Study Great Britain?

The Parker-Fess bill authorizing and facilitating voluntary consolidations of railroads, with government approval, is such a demonstration of good sense that one is led to wonder where it originated. It seems so different from anything heretofore produced in congress. Of course, there is the usual discussion. No imaginable legislation will meet the approval of all sides, but the Parker-Fess idea is far superior to the one left by the late Senator Cummins, which provided a five-year compulsory clause.

Fortunately, there is no need for experimenting in consolidations in this country. In the days when government ownership of railroads seemed to be more of a menace than at present the history of Canada in that respect was studied, and government ownership practically dropped out of the picture. The same thing may be done about consolidations. In this case Great Britain may be consulted. The British are paying the bill for a great experiment in railroads, but they have not been startlingly apparent consolidation of railroads. If the amalgamation into four groups had been a success over there probably no one would complain about the cost of the experiment; but it has been a failure, and no one likes to pay for a dead horse.

British railroads are declared to be in much worse condition than before the war. They have 10 per cent more employes and they are paying 100 per cent more wages to handle 20 per cent less traffic. This is the result, in a short paragraph, of consolidating British railroads into four groups.

The peculiar fallibility of government estimates sometimes is little short of astounding. When the late Senator La Follette proposed, in 1910 or 1912, his crazy valuation scheme, he estimated, in the United States senate, that the work would cost not to exceed $2,000,000. Up to the present it has cost more than $120,000,000, and is about as valuable as last year's straw hat. In Great Britain the government figured that the amalgamation of the railroads would save $125,000,000. Sir Felix Pole, who heads one of the four groups, a man who might be excused for prejudice, confessed that amalgamation did not save Great Britain more than $6,000,000 a year.

In Great Britain the grouping of railroads was ordered by the government. It was not desired by railroads or the public. No one seems to know the reason for it, if there was any; but perhaps it was politics. The 135 railroads of that nation are now tied together into groups, east, west, north, and south; but they are not welded together into four organizations. The result is a slowing down of traffic. Freight trains, it is said, have never been so slow in 25 years as they are today in that kingdom.

Unfortunately British railroads have no leader. Herbert M. Casson says, in the New York Evening Post, that the British railroads lack a strong personality to protect them from the encroachments of the government and the constant demands of the labor unions. Always they are being sacrificed to serve political ends. It is significant, Mr. Casson says, that when Sir Josiah Stamp was appointed president, a new office in the British consolidation, he went at once to the United States to study American railroad management, and as a result drastic changes are now being made over there.

It seems peculiar that with the fate of 135 railroads to serve as a lesson large groups still are found in this country eager to try the same experiment probably at a very much greater cost. After government ownership of railroads had proved a dismal failure in Canada an American railroad man was selected to clean up the mess. Sir Henry Thornton is doing a great work. When consolidation in Great Britain proves a flop, to use a vaudeville term, a man comes to America to study railroads, but Americans go right ahead ready to jump into the fire, doubtless to see how hot it is. There may be great economies in consolidation of where the experiment has been tried.

Why not send a competent group of railroad men —not experts—to England to study the problem of consolidation?

Commission or Court?

In deciding the St. Louis & O'Fallon recapture case the Interstate Commerce Commission very plainly admits the country is using a transportation system it can not afford, whose actual replacement value is so great that the commission can not authorize rates assuring a fair net return. This is saying in effect that the rate-making provisions of the Transportation Act are not to be enforced. The country, but more particularly the railroads, will wait with a good deal of interest the decision of the United States Supreme Court which, doubtlessly, will review the commission's findings. The St. Louis case was regarded as a test case. The valuation principles announced by the commission in its decision will apply to all railroads in the United States.

The St. Louis & O'Fallon R. R., a short line in the city of St. Louis, was held to have had excess earnings in part of 1920 and in 1921, 1922, and 1923 on the basis of the valuation fixed by the commission and was ordered to pay $226,000 to the government, representing one-half of the excess in net railway operating income in excess of 6 per cent of the value of property, as found by the commission.

The railroads have held, what seems to be a common sense view, that valuations based on 1914 or, actually, any valuation except that representing a re-

placement figure, was unfair and amounted to confiscation. The commission believed that if this theory were applied to all railroad property in the United States the value would have become forty-one billion dollars in 1920; thirty-five billion dollars in 1921; twenty-five billion dollars in 1922; and thirty-one billion dollars in 1923. The commission declares the railroads are not suffering confiscation under existing rates which were established on a total property value of about twenty billion dollars. The commission's argument was that to base value on what it would cost to reproduce the property now, which seems logical if we are to avoid socialistic government, would make it impossible to fix rates that the country could pay.

Four commissioners dissented. Commissioner Hall declared the function of the commission was not to act as an arbiter in economics but as an agency of congress, to apply the law of the land to facts developed of record in matters committed by congress to its jurisdiction. He asserted that the majority had refused to apply the law to the St. Louis & O'Fallon case. He contended that the commission was required to give weight to reproduction estimates, and cited Supreme Court decisions in support of that. "If the law needs change," Commissioner Hall said, "let those who made it change it. Our duty is to apply the law as it stands." The other dissenting commissioners were Aitchison, Woodlock, and Taylor.

A committee of important business men, stockholders and others, will ask the next congress in December to repeal the objectionable recapture clause. It might be well at the same time to urge the repeal of the entire odoriferous valuation amendment, known as the La Follette Valuation Act. The Supreme Court has already held that the recapture provisions of the Transportation Act are constitutional and there is no reason for supposing that the court has changed its mind.

Misleading the Public

There is no question but in recent years the attitude of the press in general over the country toward the railroad problem has improved very materially. That there still is need, however, to educate the editorial writers is apparent.

We reproduce in detail two editorials which appeared during April in prominent publications.

The first editorial from "Time", a weekly news magazine published in Cleveland, is on railway valuation. The misstatements would be amusing if they were not so serious—the reference to the Esch-Cummins Act pertaining to valuations being passed in 1914, the detailed explanation given, a statement that the railroads secured certain guarantees of profit, etc., are still quite original. Such statements as these carrying misinformation, are responsible for a great many of the erroneous ideas in the public mind right now.

In the second editorial from the Los Angeles Examiner, the writer slaps the St. Paul in the first paragraph, and then proceeds to hold it up as a bright and shining example. The facts as to speed attained, difficulties of operation, etc., must be of interest to practical engineers and railroad men. Says "Time," the news magazine:

> The members of the Interstate Commerce Commission acted last week like ten schoolboys appointed to settle a schoolyard dispute. They made their decision, but like schoolboys, they knew that their teachers (in this instance the nine justices of the U. S. Supreme Court) would be the final arbiters. The dispute was over the valuation of U. S. railroads. It had been stewing a long time—since 1914 when the Esch-Cummins Act went into effect. By this act congress ordered the I. C. C. to reckon up the values of each of the U. S. railroads according to some fair formula and to use such valuations as the basis upon which to figure transportation rates. The act also provided that after a railroad earned 6 per cent profits as calculated upon the I. C. C. valuation, it must split its extra profits half and half with the U. S. government. That is, if a railroad worth $100,000 earned $7,000 (7 per cent) in a year, it could keep $6 000 (6 per cent) as its Esch-Cummins profits, but must divide the extra $1,000 with the federal treasury. * * * *

This one is from the Examiner:

> Is it possible that the Chicago, Milwaukee & St. Paul, supposedly the hard-luck member of the western systems, is actually setting the pace for other roads in this territory?
>
> That, without doubt, is the case.
>
> What other interpretation could be placed on the announcement appearing in last week's Examiner about roller bearings? Consider the significance of that piece of news: The Chicago-Seattle line has ordered this equipment from the Timken Co. and is installing the bearings in 62 sleeping and 63 passenger cars—that is, 12 de luxe trains.
>
> These will be used on the "Olympian," operating between Chicago and Puget Sound points and the "Pioneer Limited," running between Chicago and St. Paul.
>
> In commenting on the meaning of this innovation in a letter to The Examiner, F. C. Fairbairn, general agent at Los Angeles, writes:
>
> **"In addition to the factor of safety and the operating advantages of this type of bearings (including anti-friction, the saving of seven-eighths of the power ordinarily needed for starting, elimination of hot boxes and the whole lubrication difficulty), trains so equipped will ride with velvet smoothness at all speeds without tug or jar in stopping or starting."**
>
> All of this that Mr. Fairbairn mentions is well established. But there is a point he omitted. That is the matter of speed. Cars equipped with roller bearings will be able to take advantage of the decreased friction and other handicaps in more ways than in economy of operation.
>
> They will convert decreased difficulties of operation into INCREASED SPEED.
>
> Instead of a 63-hour run from Seattle to Chicago, the "Olympian," running on roller bearings, will be able to make the trip in 50 hours, easily. That would make possible a three-day schedule between Puget Sound and New York.
>
> The southwestern roads, which connect California points with Chicago and St. Louis, have not yet adopted roller bearings. That they will do so is inevitable. What would automobiles be without roller bearings? If motor cars were equipped with the old-fashioned bearings there would have to be laws to prevent them from going too slow rather than too fast.
>
> Let's all give a mental shove to the proposition that our railroads should have completely modern equipment and time schedules to correspond.

When men begin really to think instead of accepting without question everything told them by vote seekers, there will be hope in the hearts of those managing great properties. But not many men really do think. To think is to seek to understand and to understand it is necessary to seek causes.

His Father's A Section Boss

ENGLISH, as it is taught, in these high pressure days, is not an inspiring course. An assignment to write a thousand words about medieval Europe or Keats is not a thrilling experience, whether it be in language or literature or as a part of the work in history. But a thousand words about railroads! There you have something filled with action, romance, achievement. Where, for that matter, is the boy with soul so dead, who never to himself has said, "I'll be an engineer"?

Francis L. Newell is the son of H. H. Newell, section foreman for the Kansas City Southern Ry., at Benson, La. He has lived always close to the tracks, and the essay he turned in, not long ago, to his high school teacher shows that environment, coupled with keen intelligence, led him to study the history of the great industry with which his father has been long connected. How many railroad men, beginning with the officers, could present such an excellent paper? Here it is without quotation marks:

Let us look at our country before the times of railroads. We then had the same fertile land, the same rich deposits of coal and iron ore and the same great forests that we have today. We know that we had these things, but of what value were they to us?

A person at that time living where there were no forests, couldn't yoke up his oxen and go hundreds of miles to get them. Neither could a man load his crude cart and take ores across the continent to the smelters.

We think that the great political leaders alone have built this great nation of ours. Of course, they have done a great deal, but we must give a large per cent of the credit to the builders of the railroads. The railroads serve not only as a track for their cars and engines to run over, but also as bands of steel to connect us. The north is united with the south and the east with the west. They make one section dependent upon the other and prove to us that we must stay united in order to maintain ourselves the greatest nation among nations.

Let us first notice what the railroads have done for the farmer alone. If the farmer should raise an enormous crop and there were no railroads, what would he do with it? He cannot raise everything that he needs at home.

In places that are not very fertile, but yet where probably there are rich deposits of minerals, they would be unable to develop it without railroads. Thus the people would be forced to leave unfertile places. The railroads act as a hero and serve the farmer, make him money, and give him the luxuries of life.

The railroads are the greatest economic factors that we have. They save fruit, vegetables and farm produce from spoiling by quickly transporting it to its destination. Iron that is of no further use to the railroads is gathered up and converted into things that can be used by other people. They buy locomotives that give power never before known, yet they use less coal. In one year they saved twenty-six million dollars by being economical with the coal.

They save the forests by giving the ties a preservative treatment that greatly lengthens their life of service.

What corporations could do more for the advancement of education than do the railroads? If it were not for them there would still be seen thousands of one-room school houses throughout the country as have been seen in former years. They are the backbone of our schools. In 1924 the leading railroads in the United States paid 346 million dollars in taxes which was two-fifths as much as they spent in keeping up all of their tracks, roadways and bridges. This is an average of $1,456 a mile. If the highways were forced to pay such high taxes there would be little need of individuals paying such taxes for the upkeep of our schools. More than one-fourth of the productive investment of sixty-five of the leading schools and colleges consists of railroad bonds; therefore, when the railroads lose it is not only them losing money but the country boy that is trying to get an education.

The railroads help in another way. In 1924, an average of 1,777,000 persons worked for the railroads, receiving an average salary of $1,613 a year. The railroads give employment not only to those who do their work but also to those that mine the coal and iron that they as well as others use, and to manufacturers that make the material the railroads use.

The safest, quickest, and cheapest way to travel is by railroad. They spare no expense to make the trip pleasant and interesting. The coaches are kept clean and every other sanitary method is taken to prevent the spread of diseases.

Freight is carried more quickly, better and cheaper than any other way. Some will say that the railroads damage a great deal of the freight that they carry. Whatever they damage, they pay for it dearly. For every ton of freight they carry they are paid only one cent a ton-mile, which is cheaper than any land transportation in the United States.

Sir Francis Bacon has told us that there are three things that make a nation great and powerful —a fertile soil, busy workshops and easy conveyance for men and goods from place to place. That is a true statement, but first we must have the railroads, then we will have the busy shops and reap more profitably the fruits of a fertile soil.

Our nation is no doubt a great one, but it will be greater when every citizen learns the value of railroads.

The motorist cannot sand his track on wet days—be careful, he may skid.

What the Papers Say

THE accomplishment of the railroads in opening up the West and in promoting the development of live stock production and marketing was completed in main outline by 1890. The great trunk lines were daily moving a tremendous volume of animals and animal products into the live stock centers which they had developed. The West was thereby made an integral part of the United States. In great degree the railroads had hastened the disappearance of the old romantic West, but in so doing they had contributed immeasurably to the well-organized western commonwealths of today—Armour's Live Stock Bureau.

The steam railroads started about twenty years ago to inaugurate and promote organized safety. "Safety First" became a common slogan. The rail lines, realizing that the very nature of railroading was hazardous, concentrated their efforts in their own organizations, particularly in the shops and in the actual handling of trains. This work has been kept up without a halt. Every railroad in the country is now carrying on safety work.

The result is that railroad employment today is less than one-third as hazardous as it was twenty years ago. Employe and passenger fatalities during the past thirteen years have been reduced nearly 60 per cent—all this in the face of a large increase in the number of employes and also in the volume of passenger traffic.—From the Peoria (Ill.) Star.

American railroads have so nearly eliminated car shortages that we have not heard the word mentioned for several years. The public has thereby been saved several hundred million dollars annually, an amount larger than the entire net operating income of the railways. This saving is actual and not theoretical.

Charles H. Keith, a leading lumber manufacturer, shows that improved railway service has made possible a reduction in stocks carried in the lumber industry alone, of $600,000,000, and that, if the reduction of inventories in other lines of business has been in proportion, it has totaled $7,000,000,000. By any method of figuring, it can be seen that the saving in carrying charges on this amount of goods is enormous.

Inadequate rates which prevent adequate railroad service, cause irreparable loss to the nation.—Hattiesburg (Miss.) American.

The Korean Railway is contemplating running an entertainment train. The train will be manned by Japanese, Korean, Chinese and Russian magicians, jugglers, dancers and so on, and will stop at each station and give performances in the train for the benefit of lonely railway employes and their families.—Los Angeles Times.

If congress enacts a rate-making bill to suit the commercial travelers, the precedent will be followed up. Every shippers' organization desiring lower rates will flock to congress. Every business which wants a competitor penalized will hurry to Washington and pull wires.

The Interstate Commerce Commission is trying to keep the railroads alive at the least cost to the shipper and the passenger. For this purpose it is necessary that each rate schedule be regarded as an integral part of a general rate structure. If one part of the structure may be knocked out by congress, how about the other parts? Would they be safe?—Chicago Journal of Commerce.

While automobile traffic accidents steadily increase in number, the railway lines of the nation are displaying a commendable trend toward greater safety, both as regards the traveling public and their employes.

Since the inception of organized prevention work among American railways in 1907 there has been a reduction of more than 81 per cent in the total number of casualties resulting from collisions on steam railroads, according to records of the interstate commerce commission. This means that, including 1925, more than 95,000 lives have been saved out of what would have been the death toll under previous conditions.—Los Angeles Herald.

The Illinois Central has just added a very classy line of smoking cars to its rolling stock and the women seemed to be the very first to appreciate them. A Chicago University professor who commutes on the line says that he found 37 women occupying seats in a smoker on a recent morning trip. They were not all smoking, but the professor says that it is characteristic of women to wish to ride where they can make some man stand.—Los Angeles Times.

Los Angeles has a club of pretty smart women, known as the Women's Traffic Club of Los Angeles, concerning whom we have just one bit of advice for the superior male who makes an address at one of their meetings. They're a bunch of good sports, all right, but woe betide the man who tries to patronize them, to "talk down" to their inferior intellects, and who winds up with an invitation to ask him any questions about traffic matters that they don't understand. They come right back with the questions — they know questions deep enough to stick the U. S. Supreme Court, and nobody ever patronizes those girls more than once.—Commercial News.

The Harriman Gold Medal—probably the most coveted prize in the field of accident prevention—was awarded in 1913 to the Southern Pacific Co.; in 1914 to the New York Central Lines; in 1915 to the Cincinnati, New Orleans & Texas Pacific Ry. Co.; in 1916 to the Alabama Great Southern Ry. Co.; and in 1925 and 1926 to the Union Pacific System.

In announcing these decisions, Chairman Arthur Williams said: "The statistics examined by the committee of awards show a remarkable record of accident prevention on practically all of the railroads of America.

"A study of Interstate Commerce Commission records from 1907 to 1924 inclusive shows a reduction of 81 per cent in the total number of casualties resulting from collisions on steam railroads with an accumulative saving of 87,000 casualties. Including 1925 these statistics show that in 18 years more than 95,000 casualties —that is, deaths and serious injuries—were averted as a result of the organized accident prevention work of American railroads. In addition to this saving of life and limb it is apparent from recent authoritative statistics that during the last four years there has been a financial saving of more than $116,000,000 to the railroads of the country as a result of this reduction of accidents."

A contributor asks how it was possible for an electric locomotive much lighter than a steam locomotive, to outpull it.

Every steam locomotive, equipped with two cylinders, has two positions, on each side per revolution, when power is only being secured from one cylinder, or at one-half its full capacity. In other words, when the connecting rods which drive the wheels are in line with the piston rods, at full and minimum stroke, they are not furnishing any power and depend on the driving wheels to carry them over these centers. As the speed of the locomotive increases the influence due to these centers is lessened, but on test at very slow speed it soon causes trouble.

To obtain power without frequent dead center, the driving wheels on a steam locomotive are made as large in diameter as practicable to handle the load and secure speed. The greater the diameter of the drivers the less the pulling capacity. An electric locomotive driven through gearing from motors to driving wheels, has no dead centers, can make very slow speeds, and will hold the rail far better than a steam engine. In actual test at Philadelphia an electric locomotive pulled 52 per cent of the weight on its drivers while a steam engine pulled 20 per cent. —G. W. Hamilton, Chicago Tribune.

Something should be done for the protection of railroad trains at grade crossings. According to figures gathered by the New York Central, 22 per cent of crossing accidents are caused by autos running into the sides of moving trains. Motorists thus show a callous disregard for the rights of rail stockholders — many of them widows and orphans living on meager estates—whose money is tied up in rolling stock dented and marred by vicious motor cars. Auto drivers are so careless. Sometimes they plow into the sides of the locomotive, tangling their radiator and front bumpers with the driving wheels of the engine; sometimes they wait for the middle of the train and then charge full-tilt. It constitutes on the part of the autoists a disregard for property rights which must pain the observant. Clearly, a railroad is entitled to immunity from such attack. It has a right to run where it runs and is seldom guilty of dangerous or unlawful speeding. To permit motorists to run into a train whenever they see a good chance is unfair. It's like "Hittin' a poor kid." If there is no other remedy we shall be obliged to equip locomotives with side cowcatchers and railroad cars with non-kinkable bumpers. There seems to be no other wav. If trains at grade crossings cannot take care of themselves a paternalistic government will have to act. This policy of ruthless assault by motorists must be stopped somehow. — Cleveland Plain Dealer.

The roads are doing record business in transportation. It is not lack of volume of business that stands in the way of their making a reasonable return on the investment. High taxes, high labor charges, high material costs, with inadequate rates are unquestionably the chief handicaps to railroad prosperity. — Beaumont (Tex.) Enterprise.

To decrease railway accidents and make the imperial Japanese lines more efficient generally, the imperial railway management has decided to spend about $17,500,000 (gold) during the next five years to replace the present 60-pound rails with 75-pound rails.

Upward of 3000 miles of railway lines are affected. — Cablegram.

Some Railroad Budgets For 1927

THE St. Louis-San Francisco, President J. M. Kurn says, has a budget which calls for a total expenditure of approximately $21,000,000 in improvements to the property. This includes approximately $7,000,000 covering construction of new line between Aberdeen, Miss., and Kimbrough, Ala., also approximately $2,225,000 covering rehabilitation work on the newly acquired Muscle Shoals, Birmingham & Pensacola R. R. He writes:

"Our budget calls for an expenditure of approximately $400,000 covering the construction of ten miles of additional main track in Missouri, Arkansas and Tennessee, also for approximately $1,750,000 covering increased yard facilities at Yale, Tenn., Fort Scott, Kans., and West Tulsa, Okla. We have an appropriation of approximately $150,000 for three new passenger stations, namely: Pittsburg, Kans., Holly Springs, Miss., and Boynton, Okla. Also, an item of $100,000 covering improvements to shop facilities over the entire railroad, as well as an appropriation of approximately $120,000 for new shop tools and equipment.

"We figure on installing ten interlocking plants at a total cost of approximately $175,000 divided as follows: Four in Arkansas, two in Kansas, two in Missouri and two in Oklahoma. Also 13 grade crossing separations at an approximate cost of $450,000; these 13 are in Missouri, Kansas and Oklahoma. We are also carrying an item for 170 miles of new 100-pound rail to be laid this year at a total cost of approximately $2,225,000.

"Our permanent bridge program calls for an expenditure of $1,000,000. Some other important expenditures, covering coal chutes, water stations, changes in grade and alignment, amount to approximately $225,000.

"We plan to make improvements to our passenger and freight equipment, as well as locomotives, to the extent of $2,375,000. This includes the construction of 600 flat bottom coal cars in our own shops. We are also acquiring 25 new express refrigerator cars for delivery early in 1927 which will be suitable for passenger train service."

President Kurn, Frisco Lines

Although the Denver & Rio Grande Western improvement program for 1926 was most elaborate, the budget for 1927 provides for an expenditure of approximately $7,000,000 and is a continuation of the policy of building up the property to the highest standard, says President J. S. Pyeatt of the Denver & Rio Grande Western Ry.

The work of ballasting with slag and gravel so extensively carried on in 1926, will be pushed to completion in 1927, and the entire main line from Denver to Ogden will then be fully ballasted, except in short stretches aggregating about eighteen miles, where important line changes are to be made in 1928. With this work completed and the elimination of sharp curvature, which is a part of the program and well under way, the Denver & Rio Grande Western will have a track of a standard comparable with that of any other transcontinental line.

Substitution of heavy rails for lighter is progressing, and 110 miles of new 90- and 110-pound rail, rolled by the Colorado Fuel & Iron Co., Pueblo, will be laid between Denver and Salt Lake City. The released rail will be used to replace that of lighter weight in branch lines, yard tracks and side tracks. The entire program for 1927 will therefore include the laying of approximately 300 miles of heavier rail.

Pile bridges, of which only a few are left on main lines will be replaced by permanent bridges of concrete and steel. The installation of additional and permanent water ways for improving drainage conditions is one of the features having special attention, and this will contribute very materially to lessening interruptions to traffic.

In conjunction with the federal aid highway improvements, substantial sums will be expended for elimination of grade crossings.

One of the improvements facilitating the movement of traffic will be an extension of the present double track system on the west

side of Tennessee Pass. When this work is completed there will be continuous double track from the summit of Tennessee Pass to the foot of the heavy grade on the west side of the continental divide. We now have double track extending over the Wasatch Range at Soldier Summit, a distance of 76 miles, between Helper and Provo, and the completion of double track program on Tennessee Pass gives us double track over our heavier grades.

The new and powerful locomotives, recently purchased, permitted a material increase in the size and length of freight trains, and $350,000 has been allotted for additional yard tracks and extension of passing tracks to 110-car capacity.

The largest individual item in the budget, involving approximately $1,500,000, is for the revision of alignment and grades. This work laid out for 1927 covers more than 100 miles of main line track, and will complete this character of improvement from the Royal Gorge west to Ogden. The changes include removal of the track from close proximity to canyon walls and mountain slopes, thus reducing danger from slides and consequent delays to traffic.

Block signals will be installed on the Denver & Rio Grande Western Railroad this year. Between 100 and 150 miles of the latest and most modern type of electric signals will be put in between Minturn and Palisade, including the Colorado River, Dotsero to Glenwood Springs. The installation of block signals in the canyon of the Arkansas, between Canon City and Tennessee Pass will follow the completion of the line changes and elimination of curvature in that section planned for 1927. This undertaking is in line with the policy of extending these signals over the entire main line as rapidly as the work can be done economically.

For the operation of a locomotive, good water is essential, and in certain districts where the character of the water requires, treating plants will be installed.

A liberal appropriation has been made for improvements in shop facilities at various points.

The Goshen Valley Railroad, extending from Pearl, Utah, on the Tintic branch of the Denver & Rio Grande Western, to the Iron King Mines, will be acquired. This railroad, constructed by the Iron King, and Tintic Standard Mining companies, not only serves the biggest silver mine in the world, but also the Tintic district, which is the largest active precious-metal mining territory in Utah.

Ten modern freight locomotives, among the largest ever constructed, and four new steel dining cars of latest type, will be purchased to meet traffic demands. During the past three years all freight equipment has been rebuilt, at a total cost of approximately $5,000,000, so that at the beginning of the year, all of the equipment is in first class condition, fully up to the standard generally maintained by American railroads.

More Than a Million Dollars Went Into Straightening the Track on the D. & R. G. W. in 1926

President Edson of the Kansas City Southern Ry., writes: "We are now engaged in the construction of stations at Gentry, Ark., and DeRidder and Mansfield, La., at a total cost of each running around $20,000. At Heavener, Okla., we have expended approximately $65,000 for a seven-stall extension to roundhouse and have installed a 105-ft. twin span turntable at a cost of $40,000. We are also engaged in grade separation work and construction of second main track through Shreveport, La., involving an expenditure of $600,000."

General improvement in business conditions in southeast Missouri, Arkansas, north Louisiana and east Texas, the territory served directly by the Cotton Belt Route, is indicated in a brief statement recently made public by Daniel Upthegrove, president of the St. Louis Southwestern Ry. Commenting on the Southwest adjusting itself to conditions created by the reduced price of cotton, Mr. Upthegrove says:

"In view of permits issued for buildings now largely under construction, and the increased acreage devoted to diversified agriculture, together with the continued develoment of the dairy and poultry industries, there are good prospects for steady improvement in general business

President Gorman of the Rock Island Lines

conditions throughout our territory.

"In many sections, and particularly in Arkansas, there is a stimulated interest in securing manufacturing establishments to utilize native raw materials, and banking and merchandising are being conducted along conservative yet constructive lines.

"The program of betterments on the Cotton Belt route has gone forward with no interruption. The physical property is equal to all traffic demands."

Building permits issued in eight of the largest cities served by the St. Louis Southwestern Ry. in 1926, with a grand total of $105,621,188, follow:

St. Louis	$39,841 564
Memphis	18,579,550
Pine Bluff	1,075,200
Little Rock	5,968,000
Shreveport	5,356,803
Dallas	16,682,928
Fort Worth	17,022,468
Waco	1,094,675

"The railroads throughout western territory, generally, have made splendid showings in the last year," writes J. E. Gorman, president of the Rock Island lines, Chicago. "The outlook for 1927 is encouraging.

"Traffic prospects for the various western lines depend largely upon the size of the crops that will be harvested. There has been a considerable increase in the wheat area sown in 1926, and with seasonable conditions, there is no reason to anticipate but that there will be a splendid crop.

"The carloadings of the railroads are a good barometer of business conditions. They have reached record proportions in 1926 throughout the western territory, and still continue very satisfactory; and further indicative of greater general activity is the large amount of business being handled on improved public highways. Based upon the present outlook, we are looking forward with confidence that we will move as great a volume of business in 1927 as in 1926.

President Storey of the Santa Fe

"To meet the anticipated heavy traffic, the Rock Island is considering one of its largest improvement budgets, which includes an item of approximately $12,000,000 for new locomotives, passenger and freight cars; and a like amount for roadway improvements, new lines, etc.

"The condition of the railroads, both as to equipment and roadway, is better now than it has ever been, and with good business prospects for 1927, the net earnings of the western railroads should be reasonably satisfactory."

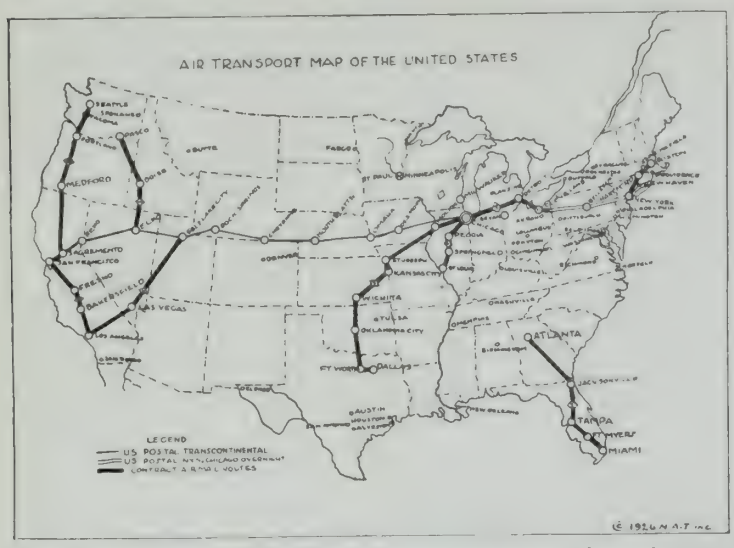
"Our budget for 1927 amounts in round figures to $67,000,000," says President W. B. Storey of the Atchison, Topeka & Santa Fe Ry. "This includes $24,000,000 to finish work authorized in 1926; $15,500,000 for new equipment, and $27,500,000 for new additions, betterments, and improvements. The equipment consists of 3,200 freight cars, 58 passenger cars, 60 locomotives and 3 gas-electric cars.

"Seventy-two miles of new second track will be built, located 4.5 miles in Oklahoma, 27 miles in Texas, and 40.5 miles in Arizona. This piece in Arizona will leave only 80 miles between Chicago and Los Angeles which is not covered by double track or an alternate route. During 1926 about 52 miles of double track were built.

"In the course of our track maintenance 921 miles of old steel will be replaced with new steel, of which 592 will be 110-lb. rail and 329 will be 90-lb. rail. Since the Santa Fe adopted 110-lb. rail as a standard for its transcontinental main lines, beginning January 1, 1925, it will have put in 1,566 miles of this section by the close of the current year.

The Missouri Pacific is entering upon an energetic and exceedingly important program for the year. Up to the present this year, the road has spent $10,500,000 for equipment. This includes 36 locomotives and 70 passenger cars.

President Upthegrove, St. Louis & Southwestern



The locomotives will be built by the American Locomotive Co. The order includes five Mountain-type passenger engines for the Missouri Pacific proper, six Pacific-type, oil burning passenger engines for the Gulf Coast Lines, twenty coal burning switch engines of the heavy eight-wheel type, fifteen of them for the Missouri Pacific and five for the Gulf Coast Lines, and five heavy oil burning switch engines for the International-Great Northern. The approximate cost of the locomotives is about $2,000,000.

The passenger cars in this order will be built by the American Car & Foundry Co., the St. Louis Car Co., and the Pullman Car & Manufacturing Co. The foregoing equipment orders are those authorized in a recent announcement by President Baldwin and are in addition to the 3,120 freight cars ordered recently at a cost of $6,500,000.

The Missouri Pacific, in line with the progressive platform upon which President Baldwin has embarked is starting, this year, a ten-year program of signal installation. When all this work is finished the Missouri Pacific will have spent more than $8,500,000 for signals, and will have automatic block protection on all main line tracks, or about 2,250 miles.

This signal program is in addition to work done during the last two years in which the road has spent more than $3,340,000 covering nearly five miles of new signal installation. The Missouri Pacific, therefore, is operating 855 miles of block signals at present. It had about 365 miles protected at the beginning of 1926 at a cost of about $7,000,000.

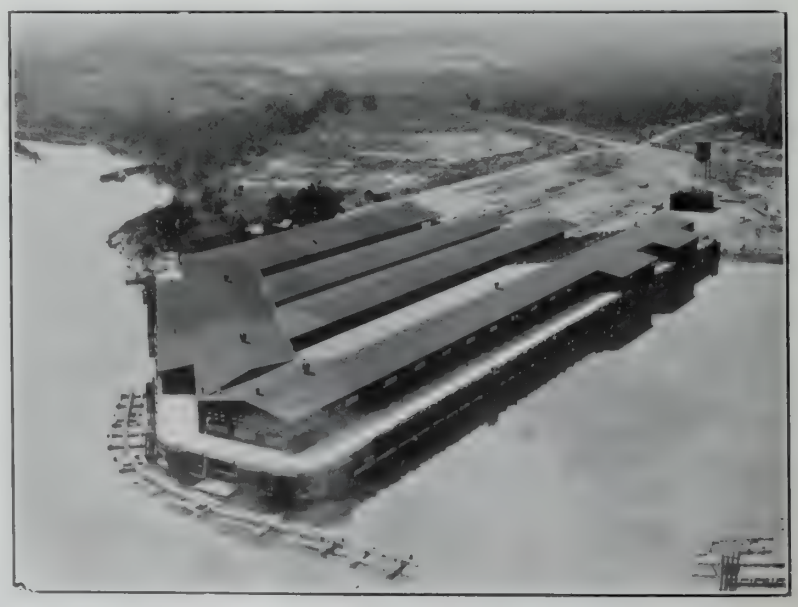
Air Mail Mileage in 1926

Mileage flown on the several contract air mail routes in 1926 was:

No. 1, New York-Boston, 78,960; No. 2, St. Louis-Chicago, 103,044; No. 3, Dallas-Chicago, 466,000; No. 4, Salt Lake-Los Angeles, 303,924; No. 5, Pasco-Elko, 181,472; No. 6, Detroit-Cleveland, 59,140; No. 7, Detroit-Chicago, 149,720; No. 8, Seattle-Los Angeles, 204,016; No. 9, Chicago-Twin Cities, 158,976; No. 10, Atlanta-Miami (discontinued), 278,210; No. 12, Cheyenne-Pueblo, 76,400; No. 13, Detroit-Grand Rapids, 21,140. The Philadelphia - Washington - Norfolk route, now discontinued, flew 92,770 miles. Total mileage 2,174,772. It should be remembered that these routes were not operating during the entire year, and that this total does not represent an annual rate. Using these figures as a basis, and including the transcontinental, the expected mileage for 1927 has been computed as 7,014,616. This includes the Cleveland-Pittsburgh, and Cleveland-Louisville, and New York-Miami routes. The first two are contracted but not yet operating.

The Morgan Flag at Houston

Regular steamer service has been established between New York and other eastern cities and Houston. The terminals and docks at Clinton on the Houston ship channel are in active opera-



Airplane View of the New Steamship Terminal at Clinton, on the Houston Ship Channel.

tion, the first steamer, El Isleo, arriving at Clinton March 3 after a quick run down the Atlantic and through the gulf.

The arrival of El Isleo, the first ship flying the Morgan flag, was made an historic event by the management of the Southern Pacific and by the civic bodies and authorities of Houston.

Back in 1875 Clinton was the terminus of a Morgan Line service operating out of Morgan City, Louisiana. The rail lines of the company from New Orleans ended at that city, and the small red ships, all of which have passed into Davy Jones' locker, made regular sailings from the Louisiana terminal to all of the Texas ports. Charles Morgan, owner of the company, was responsible for dredging a channel through Galveston Bay to deep water into Buffalo Bayou, and the small vessels made regular trips to Clinton, until the building of the rail lines from Morgan City to Houston and other Texas points made ship service unnecessary. This was in 1881. Following the discontinuance of the ship service out of Morgan City, the docks at Clinton were utilized by the Houston Direct Navigation Co., one of the service auxiliaries to rail operation of many years' duration, for the handling of barge cotton, storage and etc. Twelve or fifteen years ago, the warehouse and wharves were destroyed by fire and the location remained unused until decision was reached to create the present facilities, which, it is thought will adequately serve the demands of traffic for a long period.

The front, or south end of the new docks faces on Ship Channel and the east side on a slip 225 feet wide by 1000 feet long, having 30 feet of water. The structure consists of a reinforced concrete pier, aprons and platforms with concrete floors covered with structural steel sheds having asbestos protected metal siding and roofing. The front, or discharging berth shed is 70 feet wide by 400 feet long equipped with electrically operated conveyors and ramps.

The east side transfer shed is 70 by 825 feet equipped with electrically operated conveyors and ramps. The west side transfer shed and warehouse is 70 by 400 feet; one inside covered transfer platform 40 by 485 feet and one inside covered transfer platform 40 by 585 feet.

The docks are served by 11 tracks in three track bays having a total capacity of 150 cars, and will permit prompt delivery from steamers to wharf or cars. The wharf will accommodate three steamers, one on the channel side and two on the slip side at one time, and contains 150,000 square feet of covered floor area.

The power house is 40 by 60 ft. of structural steel frame covered with asbestos protected metal siding and roofing provided with necessary equipment to supply power for the operation of conveyors, lights and fire pumps.

Construction began in the early part of 1925, and was completed early in 1926. The total cost was $1,250,000.

New Aircraft Regulations

After July 1 any aviator flying without a license will have to explain to the federal department of commerce. The regulation requiring licenses really became effective January 1 but the department has been lenient. After July 1 the law will be enforced. In Circular No. 2 the department says, "Attention is called to the necessity for securing pilots' and mechanics' licenses, aircraft licenses, and identification numbers. The air commerce regulations have the full effect of law. They require every pilot, whether engaged in commercial aeronautics or in private flying, to have his craft registered and marked with a proper identification number. All pilots engaged in interstate commerce must get transport or industrial pilots' license, according to their class of operation. Mechanics engaged in commercial aeronautics must have either engine or airplane mechanics' licenses, or both."

The department of commerce, air regulation division, will supply all necessary information. Medical Director Bauer, head of the medical section, has drawn up three sets of standards to be used in examination of applicants. The standards are for private, industrial, and transport pilots. The section is in correspondence with about 60 physicians, with the intention of selecting competent examiners. A list of those chosen will be published in the department bulletin.

Following is a list of inspecting, engineering and professional personnel of the air regulation division: Clarence M. Young, chief of division; Louis H. Bauer, medical director; Ralph G. Lockwood, supervising inspector; John L. Hosch, aeronautical engineer; Robert H. Gast, Parker D. Cramer, W. R. Jones, C. I. Stanton, W. N. Breingan, inspectors; Frank H. Jerdone, experimental pilot.

The lighting equipment for 24 revolving searchlight beacons has been installed and 22 lights have been placed in operation on Route No. 2, St. Louis to Chicago, 277 miles. This route will have the distinction of being the first completely lighted civil airway under the department of commerce.

On Route No. 1, Boston to New York, 220 miles, all the lighting towers have been erected and some of the lights placed in operation.

Route No. 3, Chicago-Dallas, 995 miles. The ten revolving searchlight beacons at the upper end of Route No. 3 between Fenton, Ill., and Unionville, Mo., have been placed in operation. Good progress is reported on the installation of airway lights between Oklahoma City and Wichita, which is nearing completion.

Route No. 5, Pasco-Elko, 424 miles. Lighting of the 110 miles at the northern end of this route has been completed.

Five Trains of Washing Machines

The Rock Island Spreads Cleanliness

By W. E. Babb

THE 130 carloads comprising the shipment of washing machines from Newton, Ia., shown in the illustration, were taken to Chicago over the Rock Island Lines, and were then split up into five train loads and routed east over five railroads. There were more than 11,000 washing machines in the shipment with a total value of $2,000,000.

Although congress was in session the washing machines were not sent to the national capital, but to Philadelphia, the eastern headquarters of the manufacturers. The same company sent three train loads of its product into California within the last few months, and three trains into the Pacific Northwest.

The five trains sent from Newton to Philadelphia were declared to be the largest single consignment of merchandise ever carried by a railroad, and while superlatives always are dangerous this one may have been justified.

Men, some thoughtful writer once said, always invent things making it possible for women to do more work. One hundred and thirty cars of washing machines ought to fill every requirement. Shipments of such magnitude make it necessary to build and market 1,250 washing machines a day. The factory producing them gives employment to 2,000 men, most of them classified as skilled craftsmen.

The Picture on the Cover

Four kinds of transportation are shown in the composite picture on the cover this month, the Southern Pacific locomotive for the steam railroads dominating the presentation as they will continue to do for many years. The motor bus in its latest development makes pleasant the short journeys. The airplane hastens across the continent with mail and express, and the steamship serves humanity on the sea as vessels of one kind or another have done as far back in history as any one cares to search. Each form of transportation contributes to the happiness of human beings and the upbuilding of a great nation.

The Greatest Loss

"Were I asked to name the most significant development of 1926, in the realm of business," says B. C. Forbes in his financial magazine, "I should reply: The realization by our more enlightened corporations that the greatest loss of all is that due to hostile or only lukewarm working forces, and that there is infinitely more room for increasing profits by the development of intense loyalty than in any other direction, not excluding the invention and installation of more labor-saving machinery."

Another Extension in Texas

The Clinton & Oklahoma Western Railroad has asked the Interstate Commerce Commission for a permit to extend its line west from Cheyenne, Okla., to Pampa, 90 miles. It is reported that this railroad is about to pass into the hands of the Missouri, Kansas & Texas, with which system it intersects at Hammon Junction, Okla. The road was built and is owned by Frank Kell of Wichita Falls, Tex., who is president of the company. Kell has been closely identified with the Missouri, Kansas & Texas for many years. The Clinton & Oklahoma Western runs between Clinton and Cheyenne, 58 miles. By extending the line to Pampa it would intersect there the Atchison, Topeka & Santa Fe, thereby obtaining a rail connection with Amarillo and points in the rapidly developing oil fields of the Panhandle.

Five Trainloads of Maytag Washers Headed Out of Newton, Iowa, Over the Rock Island Lines, for Eastern Distributing Centers.

The N. P. To Extend In Montana

New Line From Glendive To Brockway

By F. W. DeGuire

ANOTHER of the fast disappearing frontiers is about to be wiped off the country's map. Of course a railroad is doing it. This time the activity is in the picturesque Bitter Root, Flathead, and Hellgate Valleys of Montana. The invasion is led by the Northern Pacific Ry., ably assisted by the Amalgamated Sugar Co., of Utah which agrees to put up a beet sugar factory to cost $1,500,000. Six hundred thousand acres of tillable land soon will have transportation facilities costing $4,000,000, farms will spring into existence, freight tonnage will be created, and a region in which Indians once raised everything except crops soon will hear the well known grumble against railroad rates.

The Northern Pacific's program of extensions in Montana is regarded as the most important issued in the Northwest for years. There are two projects, a new line from Glendive, Mont., on the main line, 63 miles to Brockway, via Circle.

Changing the course of the 65 mile Bitter Root branch, now on the west side of the Bitter Root River, to run 25 miles on the east side of the river between Florence and Hamilton.

Assurance that the Amalgamated Sugar Co. of Utah will build a $1,500,000 sugar plant in western Montana if the Bitter Root railway construction is authorized is carried in the announcement.

It is the old story over again. Without the railroad the land was practically valueless except for live stock, and even this industry suffered because long drives took off weight and cut down profits. Farming, fast becoming one of the great specialties in business, was handicapped by distance. With steam transportation the world's markets are within reach.

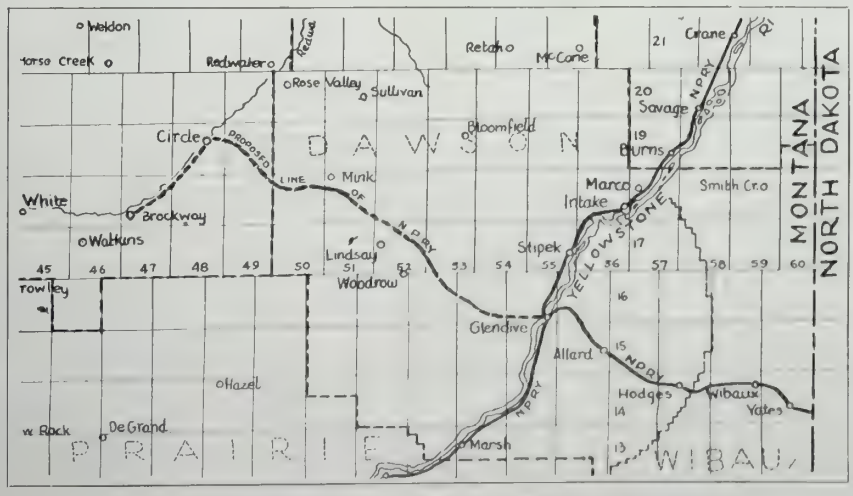
Far-reaching changes from ranching to crop production are foreseen in the Redwater Valley.

For many years land owners in the fertile Redwater Valley have been awaiting transportation facilities before turning the soil to wheat and other crop production. The announcement that the Northern Pacific is prepared to spend several million dollars to build an extension to serve them, therefore, is significant, since it forecasts rapid settlement of the valley. To Minneapolis, St. Paul and Duluth, it is expected ultimately to mean enlarged movement of grain through these outstanding terminals.

From an engineering standpoint this construction is interesting, since the line will top the divide between the Yellowstone and Missouri Rivers, requiring a 1,150-foot climb. This will be at a 1½ per cent grade.

The Bitter Root branch of the Northern Pacific is one of its pioneer branches. It was built from Missoula to Woodside in 1888, primarily as a lumber railroad tapping virgin timber areas. But agriculture, truck farming and dairy activities developed, more notably on the eastern side of the Bitter Root River, although the rail line was on the western side. For many years there has been demand for construction of the line on the east side of the river, where transportation has become a problem.

The decision of the Northern Pacific to alter the route of this branch was reached when assurance came from the sugar company that it would establish a large factory producing 450,000 one hundred pound bags of sugar and 3000 to 4000 tons of molasses annually, if the line were built part of the way on the east side of the river. The company application calls for shifting the line to the east side beginning at Florence, where it will cross the river and meet the old line 25 miles south at Hamilton, a community which in the earlier days had as one of its out-



Northern Pacific Extensions in Montana Immensely Important to Agricultural Development in That State.

One of the Pullman Private Rooms.

standing citizens and builders, Marcus Daly, who operated a great ranch there. A magnificent mansion today still adorns this fine property.

The railroad, in making the change, substitutes a bridge across the river which now is at Hamilton for one which will be built at Florence.

The Bitter Root Valley is one of the most fertile in Montana. Orchard products, beans, peas and berries are raised there in abundance. Recently one train from this branch of the Northern Pacific carried carload lots of seventeen varieties of agricultural products.

The sugar company made a scientific survey which showed 100,000 acres of irrigable land in the valley suitable for sugar beet growing. The soil analysis showed the soil to be of fine grain. North of Missoula is the Flathead Valley declared to contain 102,000 acres of irrigable land also suited to beet growing, and east is the rich Hellgate Valley also adapted to beet growing. Both of these valleys now are served by the Northern Pacific. This makes western Montana a strategic location for beet sugar production.

With the announcement that the railroad proposes to build the extension on the east side of the river, abandoning the 25 miles on the west side, the sugar beet company already is making tentative contracts for beets. The Bitter Root, Hellgate and Flathead Valleys, with flanges of mountains, are declared to be immune from the beet hopper, which is a desert fly of ruinous proclivities. These pests are in districts adjoining deserts. The Montana valleys would produce high grade beets, the surveys show.

According to H. E. Stevens, chief engineer of the Northern Pacific, engineers already have begun to make a survey in the Redwater Valley. The 63-mile extension there is expected to be completed in a year or eighteen months. The railroad already owns the right of way along the east side of the Bitter Root River, and the line will be built there next summer if the authorization of the federal commission is forthcoming.

A Pullman Private Room

You may have a private room now on some railroads when you step aboard the Pullman for an over-night trip. It has a bed in it, too—not a shelf with curtains through which some belated traveler may lurch into your presence unannounced—a bed 32 inches wide by 6 feet 5⅝ inches long, and anyone wider and longer than this ought to stay at home. The rooms, 14 of them to a car, contain full toilet facilities, compactly arranged, the washstand and hopper having the appearance of an upholstered chair. When the back is folded down the washstand can be used, with hot and cold water as usual, and there is also a dental faucet. A thermos bottle and glass are in a holder at one side. There is a mirror and glass shelf above the washstand. and a long mirror in the inside of each entrance door. A small folding table, attached to the wall opposite the bed, can be used for writing, to hold toilet articles, or for breakfast service. The floor is covered with marbelized rubber tiling in black and cream squares, with a rug at the bedside. At the head of the bed is a shoebox with a door in the corridor wall so the porter can remove and replace shoes without disturbing the passenger. There is a rack for towels, and a specially designed waste basket. Ample baggage space is provided under the bed and in racks.

The heating and ventilating systems are so complete that extremes of personal preference can be obtained. Two pipes running the length of the car under the windows in the corridor provide the general heat, sufficient to drive out the chill, while a radiator under the foot of the bed can be turned on if desired. In addition to the usual Pullman ventilation devices in the roof and the window sash slide, a current of air can be obtained by means of the vent-a-dor device in the lower part of the door. All rooms also have 9-inch electric fans. Double window shades are provided, the usual silk shade rolling from the top, and a light waterproof curtain that rolls from the bottom to cover an open screened window and keep out the cinders. Three bracket lamps of candle design with parchment shades, supply illumination, one of them a reading lamp at the head of the bed. A feature that will be greatly appreciated is a 5-watt blue night lamp over the bed. In-

A Writing Desk Where No One Can Look Over Your Shoulder.

stead of turning on the full power white light in the middle of the night the soft blue light gives ample illumination. The new cars contain 14 bedrooms with communicating doors equipped with locks and sliding bolts.

The cars are designed only for short night runs, where passengers entrain between 10 o'clock and midnight and arrive at their destination early the next morning. They are not adapted to daylight travel.

The cost of this privacy and additional luxury will be a moderate excess over the Pullman rate for a section. In the eastern territory, where these cars will be operated, one person occupying a regular Pullman compartment must pay two railroad fares for its use. In the single room car he will pay 1¼ fares, and the Pullman charge for the room will be the rate for two lower berths, which is lower than the compartment rate.

Gas Electric Cars Are Fast

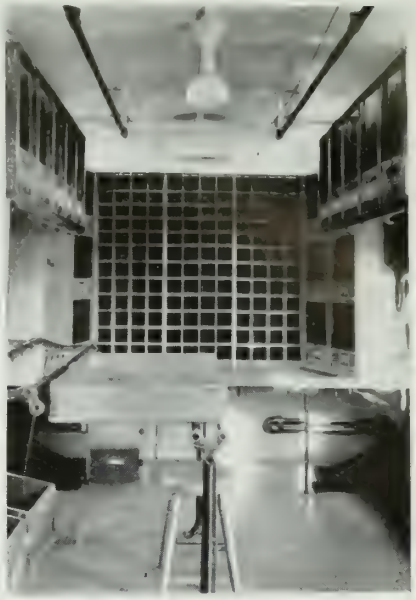
Two gasoline-electric cars are now operating on regular schedule between Detroit and Bainbridge, Ohio, on the Detroit, Toledo & Ironton R.R. These cars were built to order for the road by the Pullman Company, cooperating with the Hall-Scott Motor Co. and the Westinghouse Electric & Manufacturing Co.

Shatter-proof Glass Protects the Operator.

The 280 miles between Detroit and Bainbridge are run by the gas-electric cars in about nine hours. The cars, it is said, have fulfilled all expectations of operation, but their service to date has not been sufficient for the accumulation of much comparative operating data. They are of all-steel and aluminum construction. The dimensions are: Length over all, 72 feet 6 inches; height, 14 feet; width, 10 feet 4 inches. Weight of each is approximately 66 tons. Each car has four compartments. At the front is an operator's cab, 3 feet 6 inches long. There is a door in the front center and one at either side, the one on the operator's side containing a locomotive type window. The operator is protected in front by shatterproof glass. Behind the operator's cab and connected with it by a door is the mail compartment, a little more than 15 feet long. This is standard in all respects, conforming to R. M. S. standards. Sliding side doors are fitted with mail arms, safety visor, etc., on each side. A small safety door under the racks leads to the baggage section. Under ordinary operating conditions this is locked from the mail compartment side.

The baggage compartment, 13 feet 11½ inches long, is in the center of the car. A double-coil hot water hard coal heating plant is situated in a corner of the baggage compartment. The section for smokers is 8 feet 10 3-8 inches long with three seats on each side. The rear of the car is for passengers. There are 17 double seats. The rear vestibule is 2 feet 11 3-8 inches long and has a door at each side and one at the end. The roof frame is of steel. The roof sheets of the upper and lower deck are of aluminum alloy one-sixteenth inch in thickness. The inside finish is aluminum throughout.

The power units consist of two Hall-Scott gasoline motors under the car with an approximate horsepower rating of 150 h.p. each. Engines in car No. 36 have a 5-inch bore with a 7-inch stroke, while



The Mail Compartment Conforms to R. M. S. Requirements.

those in car No. 35 have a 5-inch bore 6-cylinder with a 6-inch stroke. A maximum speed of 1750 r.p.m. is possible but this is regulated by governors to about 1700 r.p.m. at present.

The gasoline motors are hung under each side of the cars beneath baggage compartments and can be reached easily through steel coverings in the floors. The rotation of the motors is opposed, one being clockwise, the other counterclockwise, to reduce vibration. Each motor is direct-connected to the armature shaft of a 750-volt Westinghouse generator with an auxiliary generator for battery charging direct-connected to the armature shaft on each of the larger generators. A force-feed oiling system equipped with filters and gauges to show oil pressure is used. The gasoline feed to dual carburetors is made through 12-volt electrically operated "auto pulse" pumps, four for each engine, the amount of gasoline pumped to the carburetors depending on the operation of the throttle. The engine starter is of 32-volt capacity, operated through a solenoid switch controlled from the cab. The ignition is of double type, automatic-spark advance, 12-volt system using two distributors and a double

set of spark plugs. The engine is water cooled, circulation being by pump and controlled by thermostats at the connections from the engine to the radiators. The radiator which is suspended from the underframe and motor meters connected to the intake manifold water jackets show the temperature of the water. Exhaust from the engines is carried up through the baggage room by four inch pipes and the muffler is mounted on the roof.

Built into the engine and driven directly from the accessory shaft is a specially designed water-cooled air pump. This has an air strainer and fittings to take care of the air supply required for the air brake, and is provided with a governor that opens a by-pass valve when the pressure reaches 90 pounds and closes it when the pressure falls below 88 pounds. There are two Westinghouse box frame d-c. railway motors, each supplying power to one axle of the front trucks. They are geared to the axles through helical forged gears with a ratio of 18 to 59 for 36-inch wheels. An interconnection makes possible the operation of both truck motors together or separately from either generating unit. During the test of the cars, the regular schedule was maintained for 60 miles with only one motor running.

A fuel capacity of 366 gallons is available in the two fuel tanks hung beneath the car. Benzol developed as a by-product by the Ford Motor Co. is used as fuel. Brakes are the Westinghouse A. M.L. type having emergency features and single end controlled. An air horn is operated from the cab. The trucks are of cast steel. Thirty-six-inch rolled-steel wheels are mounted on standard 5½ inch by 10 feet A.R.A. axles on power truck and standard 5 inch by 9 feet A.R.A. axles on rear truck. Journal boxes, bearings and wedges are A.R.A. standard. The cars weigh about 66 tons, and balance at approximately 49 miles an hour on one per cent grade at 1400 r.p.m. The crew consists of motorman, flagman, and conductor.

Price Changes and Freight Rates

Fluctuations in farm prices of oats are very irregular and frequently are different for the same kind and grade at different points in the same general territory having the same or practically the same freight rate to market.

This is shown by a study made by the bureau of railway economics as to the range in farm prices for the crop of 1925 in this country and the relationship to transportation costs.

"The wide range in farm prices," said the study, "was in marked contrast to the stability of the freight rates, which remained almost unchanged during the period covered. No relationship is found between freight rates on oats and fluctuations in the prices paid to the farmer. In fact, the spread in farm prices during the crop seasons of 1923, 1924 and 1925 often was greater than the total freight charge to market.

"The prices of white No. 3 oats at Beaver Dam and Sun Prairie, Wis., were different on 51 of the 52 Fridays for which comparative prices are shown. These two points also ship to Milwaukee, to which destination the freight rates are 3.5 cents a bushel from Sun Prairie and 3.2 cents from Beaver Dam. The differential in freight rate is three-tenths of one cent; the differential in price, however, in 47 weeks was 2 cents or more a bushel, and at times rose as high as 5 cents."

Higher prices sometimes were paid, the study adds, for the same kind and grade of oats at producing points involving longer hauls and higher freight rates to their natural markets than were paid at lower rates. Prices paid for oats were also different at times for the same kind and grade at different elevators at the same point on the same day.

Oats represents the third most important major cereal crop in the United States, being exceeded in acreage only by corn and wheat. The United States produces about one-third of the world production compared with 22 per cent for wheat and 68 per cent for corn. Oats is grown in every state, but three-quarters of the total production in 1925 was concentrated in ten of the North Central states, these states in order of importance being: Iowa, Minnesota, Illinois, Wisconsin, South Dakota, Ohio, Nebraska, North Dakota, Indiana and Michigan.

Claims Paid Greatly Reduced

Claims paid by the railroads of the United States and Canada in 1926 for loss and damage to freight shipments were the smallest ever reported in proportion to the amount of freight carried, the freight claim division of the American Railway Association reports. These claims amounted to $38,187,315. This was a decrease of $584,782 or one and one half per cent compared with 1925 which heretofore had marked the lowest amount for recent years. The total loss and damage bill of the railroads in 1926 was also a decrease of $58,543,061 compared with that for 1921.

Wanted to Know

An Irishman having just landed in Louisville got a position on the railroad as flagman at one of the principal crossings. One day came the Pan-American about 20 minutes late. The Irishman held out his red flag and stopped the express. The engineer jumped off very much angered, and asked the Irishman why he had stopped the train when he knew they were twenty minutes late. The Irishman replied: "That's just what I wanted to know. Where have you fellows been for the last twenty minutes?"—L. & N. Magazine.

State Taxes, A Boomerang

By Gaylor Williams

THE United States of America should indeed be the Land of the Free if there is any truth in the words of Montesquieu, the French philosopher. About 200 years ago, long before the American Republic was dreamed of, this thoughtful observer declared "Liberty always increases taxes."

"Certainly", says H. E. Morgan, United States Civil Service Commissioner, "He would find nothing in the financial history of this country for the last ten years to cause him to change his opinion."

In a comprehensive study of the costs of government, published in Current History, Commissioner Morgan says the cost of all government in the United States, federal, state, and local, in 1925 was approximately $11,125,000,000. In 1913 the total bill was $2,919,000,000.

"But this comparison gives a wrong impression," says the commissioner, "unless we take into consideration the reduction of the dollar in 1925. Expressed in '1913 dollars' the entire cost in 1925 was $7,120,000,000, or about two and one-half times the cost in 1913. The department of labor reports that in December, 1925, the value of the dollar, as indicated by wholesale prices of 404 commodities, was 64 cents on the basis of 100 for 1913. The cost was $96.42 per capita in 1925, as against $30.24 in 1913; in 1925 it was, on the average, $385.68 for each family of four, as against $120.96 in 1913.

"Federal expense has steadily decreased since the war, excepting an increase of 0.3 per cent. in 1925 over 1924; state and local government expenses have steadily increased. In 1921 federal expenditures constituted 60 per cent. of the cost of government in this country, and 40 per cent. was properly chargeable to the lesser governing agencies; but today this position has been more than reversed and federal expenditures are less than one-third of the cost. For the governments of the forty-eight states the expenditures for operation, maintenance, interest and outlays for permanent improvements increased from $1,310,333,000 in 1923 to $1,513,628,000 in 1924 and $1,614,562,000 in 1925, these being increases of 15.5 and 6.7 per cent., respectively.

"The total expended and obligated by the federal government, exclusive of the payments on account of debt, investments, stores for resale, repayment of deposits and refunds (which items are not included in the totals for state governments) was $3,472,969,000 in 1923, $3,315,237,000 in 1924 and $3,326,033,000 in 1925—a decrease of 4.5 per cent. from 1923 to 1924 and an increase of 0.3 per cent. from 1924 to 1925.

"The interest payments for state governments were $50,446,000 in 1923, $55,848,000 in 1924 and $67,662,000 in 1925, these being increases of 10.7 and 21.2 per cent., respectively. The interest payments of the federal government were $1,056,169,000 in 1923, $940,844,000 in 1924 and $881,994,000 in 1925, these being decreases of 10.9 and 6.3 per cent., respectively. Local government expenditures were $5,136,000,000 in 1923, $5,403,000,000 in 1924 and $6,184,405,000 in 1925—increases of 5.2 and 14.4 per cent., respectively.

"The total cost of government in 1925 of the forty-eight states has been given as $1,614,562,000. The comparable cost in 1915 was $494,907,000. An analysis of the 1925 payments shows that the costs for operation and maintenance were $1,043,876,311. The costs of operation and maintenance in 1915 were $381,168,000. The other 1925 payments were interest on debt, $67,662,000 (1915—$18,546,000); permanent improvements, $503,023,971 (1915—$95,193,000). Of the outlay for permanent improvements in 1925, $18,760,223, or 83.2 per cent., was for highway and waterway construction. In only seventeen of the states was there sufficient revenue to meet all payments during 1925. The payments in excess of revenue receipts were met from the proceeds of debt obligations. The total indebtedness of the forty-eight states in 1925 was $1,251,703,000, or $11.12 per capita, as compared with $424,155,000, or $4.31 per capita, in 1915. Not as outstanding examples, but merely as illustrations, the following figures covering per capita costs for operations, maintenance and interest, excluding outlays for permanent improvements, in four individual states, are given:

"New York: 1925, $12.51; 1917, $5.04; 1915, $5.00. North Carolina: 1925, $7.71; 1917, $1.93; 1915, $1.94. South Dakota: 1925, $16.97; 1917, $4.02; 1915, $4.49. Oregon: 1925, $15.01; 1917, $4.29; 1915, $4.58. The total cost of local governments has been given at $6,184,405,000 for 1925. The comparable cost in 1913 was $1,844,000,000. The total cost of government in 1925 for 247 cities having a population over 30,000 was $2,911,990,960; in 1924 the cost was $2,641,797,778; in 1917 it was $1,108,021,565.

* * *

"The enormous and increasing debts of state and local governments should cause the deepest concern. Our state and local governments are more than eleven billion dollars in debt today. In 1912, the total indebtedness of state and local governments was $3,821,896,658. We may well ask ourselves how long we can continue to mortgage the futures of ourselves and our children, and when the day of reckoning is to be. There is always the possibility that our present carefree prosperity may be interrupted."

Mr. Morgan quotes, as one of the reasons why state and local taxes are increasing, the words of "a business man of national reputation, and that is the existence of a vast number of independent taxing units in state, municipal, county and other local governments, each growing constantly from its feeling of self-importance. He recommends a thorough reorganization of the financial affairs of state and city governments, and says that 'in many cases the executive branches of our states and cities are completely disorganized. The governor has no control over administrative departments, and the mayor no control over city administrative departments. This means that each administrative department of a state or city asks independently for its annual appropriation. A budget system is impossible. Each department lobbies on its own behalf, and there is no way to compel all the departments of the state or city to draw up a common budget, which would save enormously'."

In this connection—and a very important connection it is—citizens who hear much about the "enormous earnings" of the railroads should remember that this industry pays very much more, many millions more in taxes than it pays in dividends to stockholders. These citizens should remember also that most of this money goes to the state and local governments.

While figures are not thrilling at best they are, nevertheless, convincing. Reports of the Interstate Commerce Commission show that in 1913, before the taxing orgy began, the railroads paid out $322,300,406 in cash dividends and only $118,386,859 in taxes. But this has long been reversed. In 1926 these railroads paid $395,000,000 in taxes and $355,000,000 in cash dividends—40 million dollars less to the stockholders. The citizen who smiles over this and finds satisfaction in it, under the impression the railroads are being made to pay a big share of government expense, is laughing at his own misfortune. Every dollar the railroads pay in taxes comes from the people in rates. It can come from no other source. The only way to get lower rates is to reduce the cost of running railroads.

Some Facts About Corn

Ranking first in value of all agricultural products raised in this country, corn comes closer to being an all-American product than almost any other agricultural commodity, as virtually the entire crop is consumed in the United States, according to a study made by the bureau of railway economics into the relationship of corn prices to transportation costs.

This country, the study shows, produces about 68 per cent of the world production, but only about 2.3 per cent was exported annually from 1921 to 1925, while imports were negligible. Unlike wheat, most of the corn produced in the United States is consumed on the farms, about 80 per cent being fed to live stock. Rail shipments of corn average 15,300,000 tons annually and constitute approximately 17 per cent of the total tonnage of farm crops originating on the principal railroads.

The study, which covers the crop seasons from 1923 to 1925, showed that the farm price of corn changed more often from week to week than it remained stationary, and throughout those seasons was very irregular. This would show there is no relationship between freight rates on corn and fluctuations in the prices paid to the farmers, but that such fluctuations and variations were due to general economic conditions, supply and demand, and many economic factors other than freight rates.

Iowa outranks all states as the greatest producer of corn, with Illinois second. These two states combined produce more than one-fourth of the United States' corn crop and are in almost the center of the thirteen states which produce over 76 per cent of the total corn crop of the country. In addition to Iowa and Illinois, the other eleven states were, in the order of production: Nebraska, Missouri, Indiana, Ohio, Minnesota, South Dakota, Kansas, Texas, Wisconsin, Kentucky and Tennessee.

Smyth vs. Ames

In the famous case of Smyth vs. Ames, decided in 1897, so often referred to in railroad rate or valuation litigation, the United States Supreme Court said:

> We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case.

"The only way for a busy man to get through his work is to take up one thing at a time and stick to it until he puts it through."

Everything's DeLuxe These Days

Oriental Limited A Fine Example

By Raymond Parker

WHAT was, without doubt, the greatest mark of passenger transportation progress in the history of the Great Northern, at least in so far as the public is concerned, was the establishing in June, 1924, of a de luxe transcontinental passenger service between Chicago and the Pacific Northwest. The Oriental Limited fleet, ten complete trains, is new and modern in every respect. The Pullman sleeping and observation cars were specially designed and built for the Great Northern. The sleepers consist of 12-section, one drawing room, and 10-section, two compartments and one drawing room cars with oversized, soundproof berths, divided by permanent sectional partitions, and roomy and completely equipped dressing rooms for men and women. The observation cars contain three compartments, a large general lounge, men's smoking and club room, women's shower bath, lounge and a buffet. The outside platform is deeply recessed, allowing generous space for observation, and the extra high, wide windows serve the same purpose inside. Of course, there is a modern barber and beauty shop, a ladies' maid, a valet, shower baths for men and women, and a library.

Deeply Recessed Platform Popular With Travelers on the Great Northern

Meals are served in new, wide, dining cars completely and compactly equipped, and decorated to conform to the general scheme used throughout the train. Both table d'hote and a la carte meals are served. The new Class P-2 engines which haul the Oriental Limited are giants of the rails, and among the most powerful locomotives used in passenger service anywhere. Their total weight with tender is 617,800 pounds, and they measure 94 feet 8 inches over all.

The Oriental Limited leaves Chicago daily at 11 p.m., and travels the 2225 miles to Seattle in a little less than 70 hours, or two hours less than before the new trains were put into service. Oil-burning locomotives are used on over 1200 miles of the line. This gives the Great Northern the longest cinderless mileage of any transcontinental railroad.

The main route of the Great Northern is protected by an uninterrupted electric automatic block signal system, the longest continuous stretch in the United States.

An electrification project now under way on the Great Northern has attracted the attention of railway officials and electrical engineers because of the magnitude of the project itself, and because of the unique combination of the two systems of electrification, using the 11,000-volt, 25-cycle, single-phase alternating current system on the trolley with direct current traction motors. The present work constitutes the first step in a program that will include electrification of about 100 miles of main line

One of the Great Northern's Powerful Oil Burning Locomotives Pulling the Oriental Limited Through the Cascades

from Gold Bar to Wenatchee, Wash., upon completion of a new tunnel through the Cascades.

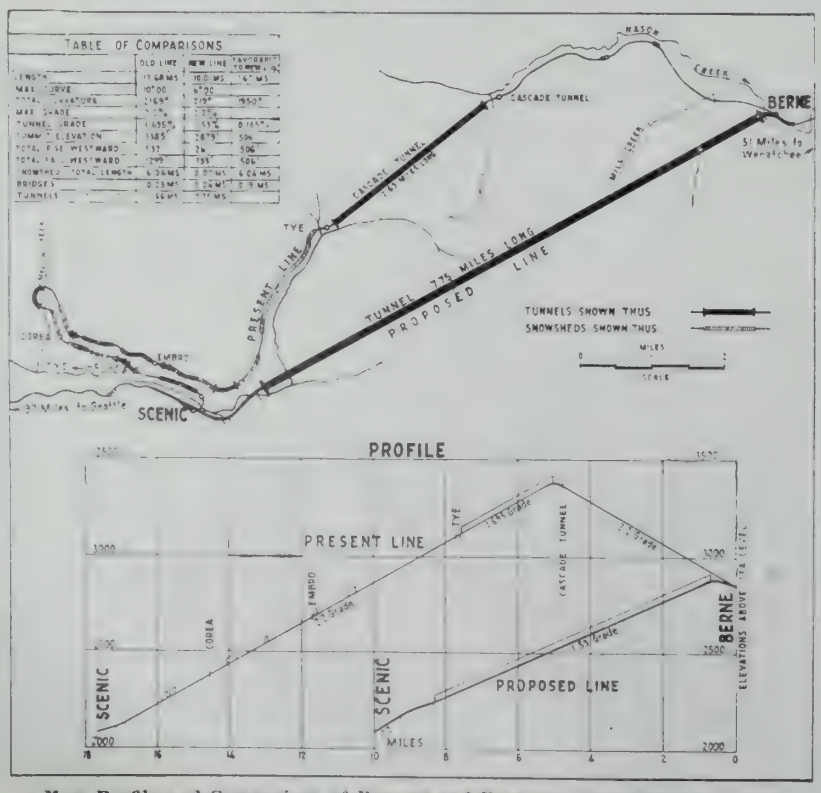
In connection with the new electrification there was placed in service recently, two new Baldwin-Westinghouse electric locomotives of the motor generator type, the most powerful of their kind. Each of these units consists of two identical cabs, and each is self-contained or fully equipped to operate alone. These electric engines weigh 715,000 pounds, are 94 feet 4 inches long, and exert a tractive effort of 137,500 pounds. The motor generator type locomotive was chosen in order to secure the advantages of alternating current transmission, and trolley and direct current traction motors. This means high voltage transmission to the locomotive with minimum copper loss and power loss, stationary unattended transformer stations along the railway line, light overhead construction, plus the advantage of direct current traction motors with practically unlimited flexibility of control in operation and regeneration. Power will be provided under a contract between the Great Northern and the Puget Sound Power and Light Co.

At the same time, with the development of its electrification project the Great Northern began construction of the new 7¾-mile long tunnel through the Cascade Mountains, one of the greatest engineering works in the history of railroading. The new tunnel, extending from Berne on the east slope of the Cascades to Scenic on the west, is being driven through the mountains at a cost of nearly $10,000,000. Its completion, which is expected in 1928, will give the Great Northern a new line between Berne and Scenic 500 feet lower, and will substitute nine miles of absolutely straight track with 7¾ miles of tunnel for 18 miles of very curved track with nine miles of tunnels and snowsheds.

The tunnel is being built by A. Guthrie and Company, Inc., St. Paul contractors, under the general direction of J. R. W. Davis, chief engineer of the Great Northern, and under the personal supervision of Col. Frederick Mears, assistant chief engineer, lines west, Seattle. Construction is by the "Pioneer" methods. Under this plan a small tunnel is being driven at one side of the main tunnel, the center lines of the two being 66 feet apart and parallel. The pioneer tunnel is 8 feet high and 9 feet wide. Small cross drifts are run from it to the large tunnel so that in excavating the larger several crews can work in as many locations, removing the rock through the cross-cuts and the small tunnel. The main tunnel will have a finishel clear width of 16 feet and a height of 20 feet, 10 inches above top of rail. It will be lined with concrete the entire length.

Great Northern appropriations for 1927, in addition to the year's proportion of the $10,000,000 being used for the Cascade tunnel construction, provide $40,000,000 for upkeep of equipment and road, and for improvements. These improvements include five important changes in the line; three in the Kootenai River canyon of Montana, one in the Scotia canyon of Washington, and one on the Spokane division at Lamona and Irby. These changes involve what is virtually reconstruction of miles of line to eliminate curvature, strengthen the road with new rock and gravel ballast, and to lay heavier steel.

New equipment provided for includes several additional electric locomotives; some completed and already in use, others now under construction, and the construction of 500 box cars and 100 flat cars. Money is provided also for underframing of 2000 box cars, the work on these to be done in Great Northern shops at St. Paul and St. Cloud, Minn.; Superior, Wis., and Great Falls. Six years ago the road had no steel underframe box cars. Now it has more than 10,000.



Map, Profile and Comparison of Present and Proposed Lines Between Berne and Scenic, Wash., on the Great Northern Ry.

Little Stories About Big Men

The Human Interest Side

The Late W. R. Scott

MONEY and position count for very little in this world if a man lacks friends. About the finest tribute paid a great publisher when he died a few years ago, came from an old time reporter. "He was worth twenty millions," said a business man. "Yes," said the reporter, "but all his men loved him just the same."

When W. R. Scott, president of the Southern Pacific's Louisiana-Texas lines died very unexpectedly not long ago, in Los Angeles, the customary statistical accounts of his career were printed. He had been successful in his chosen work. He was sincerely mourned. "But," said one of his many, many friends, "every railroad man's career is statistical, more or less, if you don't go along the lines where he has been known, and learn what people think of him. The thing of chief interest is not so much the job gained by Mr. Scott by faithful and loyal attention to duty. He was a good husband and father, but some men qualify this way at home and yet are tyrants over those they employ just as some men are jolly good fellows down town and demons at home.

"In Will Scott we had the fine balance inevitable in a real gentleman, and it isn't very easy to fill that bill in all the walks of life. He had friends everywhere because he deserved them, and because he was as true to them as he was true to himself.

"Before he became a fireman, long years ago, he was employed in the Newton shops of the Santa Fe. He was just naturally a student. He believed in preparedness, and he studied and worked toward the day of advancement. His job in the shops helped him to fit himself for his first promotion, and one day it came. He was made a fireman. That's hard work. After a while he became an engineer, and then John Player, superintendent of motive power, appointed him a traveling engineer. He learned all he could about Santa Fe power. He knew the road. Later he became an acting master mechanic. Operating officials began to notice him. You can't keep such a man down, and no one wants to, anyway. Good men are needed. Sometimes they are overlooked, but not often. Soon we heard of Scott as trainmaster, then superintendent, and so on up to the top. His was a strong personality. He became known for fair dealing. He was a born cooperator, and he got results.

"I have seen letters come to his desk for his signature, letters with a sting in them showing the writer's irritation or bad temper. They were never signed. 'I never have to write letters like this to get things done,' he said, and that ended it.

"When Mr. Scott went to the operating department of the Santa Fe's Coast lines he found a practice in vogue of laying off men and making them lose the time they were suspended as a disciplining action. He had it stopped. The suspensions were marked against their record instead. 'This will answer the purpose,' he used to say, 'and it won't penalize the families by cutting down their earnings'."

Dr. S. D. Hutsinpillar of Eagle Rock, Los Angeles, was an old friend. He and Mr. Scott met one day in church at Berkeley when the preacher asked an usher to introduce him to "that fine looking man in the fourth pew at the right."

After a few minutes' chat Mr. Scott invited Rector Hutsinpillar to have luncheon with him the next day in San Francisco. The invitation was accepted, and upon Mr. Scott's suggestion it became a weekly function while he remained on the coast. "You teach me religion," he said to the minister, "and I'll tell you all I can about railroads. We'll help each other to be the best, each in his calling."

After these pleasant meetings had to be discontinued Doctor Hutsinpillar's work took him often up and down the Southern Pacific lines. "I used to ask the trainmen and station employes whether they

W. A. McGonagle, President, Duluth, Missabe & Northern Ry.

knew Mr. Scott," the minister said one day. 'You bet we know him,' was the typical reply. 'He looks out for us just as he looks out for the lines.'

"One day in his office I saw two angry men come in to air their grievances—laboring men, mad as hornets at somebody about something. He called them 'Pat' and 'Jim,' and asked them quietly to tell him what it was all about. 'Now, that's your side,' he said, when they were through. 'But you know there's always two sides to a question, boys. Here's this letter from the boss.' Then he read the other side of the story. The two complainants were willing to let Mr. Scott arbitrate. Kindly and clearly and fully he gave his views and his decision, and when he finished they departed satisfied. 'Fine, we're glad we came,' said one. 'You always make things right'."

Mr. Scott's success and his popularity were due in a very large measure to his philosophy of life, which is, perhaps, true of all of us. Not long before his death he wrote in a Southern Pacific publication:

"Life is a service. Life is nothing unless in its relation to the individual, it finds its expression in a real service to man and to the things which conspire to loyalty and the development of happiness.

"The life well lived, leaves its impress upon the environment of which this life was a part, and upon the persons with whom it came in contact, and whom in some degree it served, for unless there was some character of service, its mission remained unfulfilled, and existence, in many of its phases deprived of what its units had both right and reason to expect.

"In the broad field of human effort and accomplishment, those stars shine the brightest which reflect service to others. In our own particular calling, service is, and must remain, the yardstick which shall measure the sum total of our efforts. In this the individual is as the whole. Our units are interdependent. They are so closely allied that deviation from the known horizon will cloud the efficiency of all.

"Life belongs not alone to its possessor, but rather does it belong to all, and because of this community of interest it should be conserved against the hazards from within and from without, and so develop a quantity and quality of service, that when it shall have winged its way to immortality, it shall still live, bright and scintillant with the joys it has brought to others, and the simple and unostentatious service it has rendered where this service was due."

A gateman at the ferry in San Francisco said the day of Mr. Scott's funeral, "Too bad. I'm sorry he won't go through these gates again. He always cheered us up."

At the National Safety Council Convention at Detroit not long ago Mr. McGonagle, president of the D. M. & N., told this story:

A lot of old engineers were loafing in the enginehouse swapping varns, each evidently trying to tell the biggest lie. Finally one old fellow, who had kept quiet for a long time, spoke up and after making a few slighting remarks on the trifling experiences of the preceding talkers, he said, "When I was on the Mt. Ararat and River Jordan Ry., I had some experiences worth talking about. The road runs three times around the mountain and then crosses the River Jordan into the Garden of Eden.

"One day, I was coming down the mountain about 60 miles an hour with 90 loads, 50 cars of manure for the Garden of Eden and 40 tanks of holy water for the Pope, when I noticed that the bridge across the Jordan had been washed out, so I opened her up and we hit the river at about 90 per, jumped clear across and landed on the rails on the other side. I switched out the manure in the Garden of Eden and then ran special to Rome with the 40 tanks of holy water which I delivered in person to the Pope. After the Pope heard my story, he says to me, 'Bo, that was certainly a remarkable performance, and I am going to have a gold medal struck off for you, but listen Bo, hereafter leave the miracle business to me'."

One of the most important

Robert Dollar, Head of the Dollar Steamship Co., and Carl Gray, President, Union Pacific System.

Western railroads appointed a new president a few months ago.

The job pays at least $50,000 a year, and you might think the directors would have selected an experienced railroad man to fill it. No! They offered it to a lawyer. Apparently no out-and-out railroad man was available.

The action confirms a belief common for quite a number of years. It is that for the highest positions in industry, years of experience are not an asset. They are likely to be a liability.

Men who have spent their lives in subordinate positions in an industry "know" that certain things cannot be done. The man who is not wedded to tradition believes they should be done — and sees that they are.

The foregoing item brings to mind the fact that railroads, like other great industries, are managed by men who were ready for the job when it came along. Among the railroad presidents there are many kinds of men, but with few exceptions all of them came up from the bottom. But they traveled different routes in reaching their destinations. Some were lawyers, some were engineers. Others emerged from the traffic department. Many rose out of the operating department, and mostly these are referred to by the men as "real railroaders." Some are human beings, and this kind bulks large in the West, and some are hardboiled, a reference which once roused President Baldwin of the Missouri Pacific to say, "Why shouldn't railroad men be hardboiled? They've been in hot water a good many years."

"Railroad men," said Carl Gray, president of the Union Pacific System, "have one overwhelming ambition. I believe it is the passion of all of them, realizing their full responsibility to the public, to measure up first and foremost to one great desire, and that is to be understood."

Mr. Gray is one of the most human of men, a constant and tireless reader of good books, a great story teller—clean, funny stories, a man with the vein of humor strongly developed. He never swears, which is, perhaps, just a bit unusual among men who have good reason for being explosive. Like all presidents of railroads he is an extremely hard worker, but

L. W. Baldwin, President, Missouri-Pacific Ry.

when his boy was scheduled to play in a great football game at Chicago he dropped everything, and traveled down from Omaha to see his offspring perform.

To travel across the country with Carl Gray is a joyful, and exceedingly enlightening experience. Books and stories, some interesting recitals of things that happened when he was operating chief during the World War, and never a word against any man, willing always to admit that perhaps the other fellow had something on his side. He is a charming public speaker, a quality not often found among the big executives. He started his earning career as a telegraph operator somewhere in the middle west, as so many railroad presidents did. He knows his job from the days of cleaning the station lamps and sweeping out to the days when he took over the management of a very great property.

When President Baldwin went from the Illinois Central to the Missouri Pacific the story is told that one of the trainmen read the announcement, pointed to the new executive's initials, "L. W. B." and exclaimed, "Let work begin."

And the man must have known something, because it wasn't 24 hours before things began to stir on the old road. It hadn't paid a dividend since Jay Gould was a boy. Now the long deferred payments, it is reported, may soon be liquidated. President Baldwin is another of the very hard workers.

A story is told about one of the old time negro waiters on the Illinois Central. The man had been told he might be transferred, if he wished, to St. Louis to work for Mr. Baldwin in his business car.

"Noh, suh," he replied. "Ahm doin' fairly well right here. Ahm not goin' ovah there to stay up all night a-makin coffee for that man Baldwin. He don't neveh know when bed time comes. He jes' ain't got no bed time."

In the Illinois curio exhibit at the St. Louis World's Fair of 1904 was a red cedar tie taken from the roadbed of the first railroad line built in that state in 1866. The tie was in perfect condition after being used 30 years. The line from which it was taken is now part of the Wabash system.

It Takes the Irish to Beat the Dust

IT WAS a hot day on the desert division, a July day. It was dusty too, with a couple of adjectives not to be used here. It was so dusty that the president and other dignitaries with him on the rear platform couldn't see anything much to inspect, and inspection was the sole underlying purpose of the journey. Wiping his tired eyes gently, for that is the way to wipe them on the desert, the president turned to the general manager and made an important announcement.

"Mr. Dyer," he said, "something must be done about this dust."

"Second the motion," said that gentleman, and turning to the division superintendent, he added, "Mr. Whalen, we want this dust laid, eliminated, or whatever it is one does with dust."

"All right," said Mr. Whalen, "all I need is the authority."

"You have it," said the president, passing over all heads. "Go ahead—eliminate it."

This was the genesis of one of the most important achievements in the interest of passenger-comfort on the Southern Pacific, an improvement already adopted on the Union Pacific and being considered seriously by a number of other important railroads.

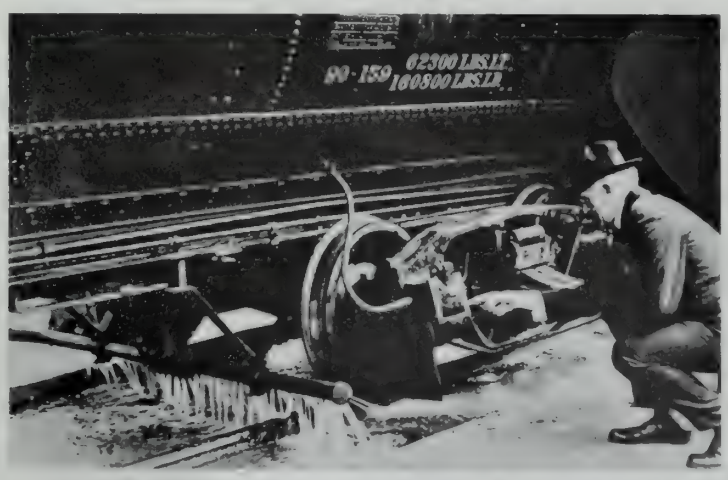
For many years railways have tried to rid passenger transportation of dust. Seeking refuge on the "observation end" from the stuffy, dusty interior of the car, only to be driven inside again by worse dust encountered on the outside is an unpleasant experience.

Railways have spent hundreds of thousands of dollars in spraying rights-of-way with crude oil, only to find that the dust soon formed a coat over it so that the evil to be destroyed was aggravated. The dust soon began to move again, laden with oil, and when deposited on passengers and their clothing, as well as on the woodwork and upholstering of the car, caused annoyance. Damage claims have been paid on account of clothing ruined in this way. Furthermore, the oil acted as a lubricant to the ballast, causing it to "work" under the load of the heavy trains, with consequent destruction of the line and surface of the track, an added expense and danger to the trains.

W. H. Whalen of Los Angeles, former superintendent of the Los Angeles division of the Southern Pacific, a district known for its dust in the long stretches of desert country, solved the problem by spraying the roadbed under the moving train with water taken from the locomotive tender. He has developed and patented a sprinkling device operated by the locomotive fireman whereby this is accomplished.

By this means enough water to lay the dust is sprinkled beneath the tender, between the rails and for a distance of about three and one-half feet on either side of them wherever dusty stretches of track are encountered. Signal flags of distinctive design are placed along the right of way to indicate to the engine crew the places where sprinkling is required. The water is taken from a point high enough above the floor of the tender tank to insure an adequate reserve supply to meet the requirements of the locomotive. Ballast is unharmed, as the water used quickly evaporates. The sprinkler has served also to prevent fires in bridges, reduces temperature, and cuts down the number of hot boxes by keeping dust out of the journals.

After testing this device for about four years the Southern Pacific has found it effective and economical, and is equipping its entire system with it, to the great gratification of its passengers. The Union Pacific has followed the lead of the Southern Pacific and is now preparing to do likewise. Mr. Whalen has now obtained a patent covering his device in Canada.



The Whalen Roadbed Sprinkler Used on the Southern Pacific and One or Two Other Lines West of Chicago

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The Korean Railway is contemplating running an entertainment train. The train will be manned by Japanese, Korean, Chinese and Russian magicians, jugglers, dancers and so on, and will stop at each station and give performances in the train for the benefit of lonely railway employes and their families.

Behind every success there is a bit of personality; and big personalities have their foundations laid deep.

Efficiency—

Better Locomotives Intensive Operation

PROBABLY no record more clearly reflects the progressive spirit of American railroads than the remarkable increase in efficiency of railroad operation during the past few years.

This is due in part to the high efficiency of modern locomotives—greater drawbar horsepower . . . . the ability to haul more tonnage at higher speeds . . . . the ability to get increased ton-mileage per unit of fuel burned.

Two factors have been responsible, in a large measure, for this improvement in motive power the Elesco superheater and the Elesco feed water heater.

On any locomotive, the Elesco superheater means a 33 per cent increase in hauling capacity. It means also a 25 per cent reduction in fuel burned per thousand ton-miles.

The Elesco feed water heater gives a further economy in fuel burned. When the steam demand exceeds rated boiler capacity, it increases the locomotive ton-mile-per-hour capacity. Under all conditions, it reduces fuel consumption per thousand ton-miles by 12 to 15 per cent.

More than 52,000 Elesco superheaters and 2,200 Elesco feed water heaters have been applied to American-built locomotives.

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Tales Of Three Old-Timers

WHEN a man serves one railroad company for more than 57 years he certainly ought to be entitled to a real banquet. And this was the special honor, in addition to the customary pension, conferred on Roger Trewick, engineer, at the Palace Hotel, San Francisco, when he was retired on New Year's eve, his seventieth birthday, after 57 years and three months of continuous service, the longest in the history of the Southern Pacific Co. for any employe. More than 200 officials and employes were present.

Roger Trewick

Think of the developments in transportation during this man's working life! The first transcontinental railroad had been in existence only five months when he began his career at the age of 12. Boys, in his day, were more self-reliant than now, not because they were any better boys but because self-reliance was more in demand. Think of the changes, the improvements, the marvels of science, the inventions, the higher living standards, the immensely higher wage scales that have come into existence, and think of the many interesting things Trewick must have said, in 57 years, about tea kettles and train dispatchers and tallow pots, and what not! Imagine, if you can, the hours and days and weeks he must have spent on sidings marvelling over the mental condition of the men who figured out his meet orders! But think, too, of the intelligent watchfulness of a man working 57 years in an extremely hazardous calling, without one accident to mar his record!

There were no airbrakes when Roger Trewick started railroading, no telephones, no electricity, no steam-heated cars. The list of comforts and conveniences brought into common use, even since he took his first engine in 1880, reads like the most fantastic dream of Jules Verne. There must be a fine satisfaction in looking backward over such wonderful years. It is interesting to imagine, too, whether Trewick ever has contrasted his experiences in America with what they might have been had he remained in England, his native land, where an engineer of his qualifications, on such an important passenger run as the Flying Scotsman, works for the American equivalent of $26 a week.

For many years Trewick was on the passenger run between San Francisco and San Luis Obispo. For the past fifteen years he has been in passenger service on the Del Monte branch of the Southern Pacific.

The whole Trewick family has been, and some of the members still are, railroaders with very fine records. The father, a blacksmith, was employed by the Central Pacific Co., parent organization of the Southern Pacific, before the first transcontinental railroad was complete. Two of the sons, Harry and Archie, attended the banquet in Roger's honor, January 6. Archie Trewick has been passenger engineer of the Southern Pacific's Salt Lake division for 47 years, with three years yet to go before retirement, and Harry is road foreman of engines for the Northern Pacific Ry., with a total service for his company of 44 years.

Mail Pay Increased

Ten small railroads operating in Rocky Mountain and Pacific Coast territory were given permission by the Interstate Commerce Commission today to increase rates for hauling the mail by amounts ranging upward of 50 per cent.

The difficulties of operation on the short lines, the commission held, entitles the roads to larger earnings from the mails. The award is retroactive, effective from the different dates of 1925 when the railroads filed their complaints.

Roads which will receive the increase are the Montana, Wyoming & Southern; Magma, Arizona; Eureka-Nevada; Utah Railway; Great Western Railway; Virginia & Truckee; San Joaquin and Eastern, Nevada - California - Oregon; Bullfrog-Goldfield, and the Arcata & Mad River.

Railroad men are said to be the most careful motorists. Why? For one thing, railroad men know it is useless, foolish and positively dangerous to argue with a locomotive. Furthermore, railroaders have dinged into them, day in and day out, the virtues of safety first, and still further they have developed a sense, a brain cell dormant in the heads of most motorists.

A research engineer says the practice of the Pullman Company in making up berths so that passengers will sleep head foremost is scientifically correct. It means better circulation and sounder sleep. But the rule is not obligatory. If you disbelieve in science you are permitted to try to sleep t'other end to.

Taking Education to the Men

A Railroad Academy on Wheels

By Stanley Walber

OLD time trainmen and dispatchers remember the day when they were called into the office by the trainmaster or the chief to stand examination in time card rules. Sometimes advance notice was given but most often the test for promotion came as a surprise.

Things aren't done that way nowdays. There are schools of several kinds for employes and on some principal railroads instruction cars, especially built and furnished for the purpose, pass over the divisions at regular intervals, taking the education to the men who can not go to headquarters to get it. So thorough are all these courses that no excuse remains for any man to be uninformed about his work.

On the Burlington and other lines special and very careful instruction is given the station and train forces in loading freight, and particularly in making up local freight trains to avoid delays on the line. There are schools for apprentices in the mechanical departments, safety first meetings, signal and air brake instruction, and other branches of work.

The Southern Pacific Co. has what some of the men call the Traveling Academy. This car is an advance construction idea, and is equipped with almost every modern device and test needed in railroad educational work. The car is 72 ft. 6 in. in length, has steel underframe and trucks, and is equipped with vapor heating system and electric and Pintsch gas lights so arranged that connections may be made in any city visited.

Three staterooms are provided for the chief instructor and his assistants, with a commodious office twelve feet in length at the observation end. A shower bath and other conveniences are included in the accommodations.

Approximately one-half of the instruction car is devoted to a class room with a seating capacity of thirty. This room is equipped with an automatic block signal working model, the signals being operated from a storage battery. A display board, provided in the bulkhead near the center of the car, enables charts to be exhibited effectively and illuminated. There is also a time table apparatus for illustrating various conditions under which trains may be placed when a new time table takes effect.

By means of a projecting machine in what is known as the picture room, train orders may be flashed upon a screen in front of the display board where problems are worked out in connection with the miniature road.

The car is intended to serve a territory of about 9,000 miles, comprising what is known as the Pacific System, for the examination and instruction of approximately 10,000 employes on a round trip. Stops are made at points where crews lay over, making it convenient for men to attend at either end of their run. Where telegraphers are employed the car is held the required time for thorough examination and instruction.

The personnel of the examination board comprises men qualified by long experience in train and engine service, and in dispatching. The local examiner on a division questions employes just entering the service or those promoted to new positions. But all employes are required to attend these examinations in order that the work may be kept fresh in the minds of all.

In this manner a conductor or engineer has the benefit of questions and answers between a dispatcher and examiner, and brakemen and firemen learn the problems that confront conductors and engineers. As the car passes over the division, examiners check all train orders used by conductors and engineers to see whether they are in proper form and legible. Attention is directed to any ir-

This Traveling Academy Takes Education and Examinations to Employes on 9000 Miles of Railroad

regularities, and the class receives instruction on the spot concerning the necessity for correction. A similar check is made upon dispatchers' train order books, train sheets, train registers, checks of train registers, and clearance cards.

Division officials find it to their advantage to be present at these examinations to familiarize themselves with instruction and thus obtain a uniform understanding of the company's practices. As new conditions obtain and improved methods of operation are conceived, the instruction car plays an invaluable role in practical demonstration of the ideas to be adopted. Employes take keen interest in the visualization of problems thus graphically presented in the class room and enjoy marked benefits.

Western Pacific Net Improves

The Western Pacific R. R. improved earnings and net income in 1926 over 1925, in its annual report to the state railroad commission. Operating revenue was $15,500,045 in 1925 and $16,057,065 last year. Operating expenses dropped from $11,332,942 in 1925 to $11,275,139 in 1926. Taxes in 1926 were $1,305,603 and in 1925 they were $979,995, leaving the operating income of $3,476,322 in 1926 and $3,256,105 in 1925.

An Electric Alarm Fence

Riding through a mountainous country on a passenger train, have you ever wondered, especially on a stormy night, whether there might be a landslide or a boulder on the track ahead? Indeed you have, and so have all travelers, because such a thing has happened. But it won't happen again, not, at least, on the Union Pacific and some other forward looking railroads whose officers are giving close attention to safeguarding passengers' lives.

Look at the pictures. They show the latest electric "alarm fence" now used by the O. W. R. R. & N. unit of the Union Pacific where needed to protect its trains and soon to be installed by the Union Pacific in the canyon on both sides of Caliente, Nevada.

The fence is made of hog wire. The staples are driven only part

Plug Location Showing Relay Box Housing Two Cell Primary Battery

way so that when a large rock falls against the strands of slack wire they tighten and pull a switch on the nearest large post. These large posts are set about 800 feet apart. The switch controls the block signals and also automatically operates the safety control device in the locomotive cab of any approaching train.

General Manager Knickerbocker says that while the device is simple in design and construction its efficiency already has been satisfactorily tested.

Helping the Travelers

More than 1,300,000 persons received help last year in traveling from one place to another in the United States. This was revealed recently by the annual report of the National Association of Travelers Aid Societies. Approximately one million dollars was spent in accomplishing the task. Marcus L. Bell, New York, vice-president of the Chicago, Rock Island & Pacific R.R. is president of the organization. Among the directors are, L. W. Baldwin, president, Missouri Pacific; Will H. Hays, Sullivan, Ind.; Elisha Lee, vice-president, Pennsylvania Railroad, Philadelphia, and Robert S. Binkerd, vice-chairman, committee on public relations of the eastern railroads.

Practically every human problem imaginable was included in the cases presented to the travelers aid representatives in the past year. There were 49,380 children traveling alone; 1,252 marriages had to be witnessed; 4,838 runaways were aided; 30,830 travelers, mostly immigrants, had difficulty with the language; and 4,987 lost their tickets or money and needed assistance. The biggest single problem presented in point of numbers was lack of knowledge of the city in which the traveler had just arrived. A total of 471,406 confronted with this problem were aided last year by the Travelers Aid Societies. Others received valuable advice and information; medical assistance; legal assistance; directions in regard to securing transportation, as well as temporary and permanent lodgings; help in making connections with relatives; being placed enroute, etc.

A man may believe that honesty is the best policy, and he should be careful not to let the policy lapse.—Christian Business.

Short R. S. F. Panel Near Hood River, Ore., in U. P. Alarm Fence

Forty Years Experience for the Railroads

DWIGHT P. ROBINSON & COMPANY offer complete service in the design and construction of Shops, Buildings, Terminals, Power Plants and the Electrification of Railroads.

Many roads have found it profitable to relieve their own engineering and motive power departments of the burden of unusual demands and in such cases to centralize responsibility for design and construction in an organization qualified by experience.

Dwight P. Robinson & Company (with which organization Westinghouse, Church, Kerr & Company was merged in 1920) has had forty years experience in all types of railroad construction and is prepared to carry out an undertaking in whole or in part. The service offered is as flexible as it is comprehensive. In preparation of plans and performance of the work, there is close and intelligent cooperation with the engineering and mechanical departments of the railroad.

Over a period of years a large volume of work has been done for such representative roads as:

Baltimore & Ohio	Chesapeake & Ohio	Lehigh Valley
Burlington	Chicago and Alton	Missouri Pacific
Canadian Pacific	Chicago, Milwaukee and St. Paul	New Haven
Central of New Jersey	Erie Great Northern	Pennsylvania

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INCORPORATED

ENGINEERS AND CONSTRUCTORS

CHICAGO NEW YORK LOS ANGELES

MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED

Cutting Out the Human Element

Some Facts About Train Control

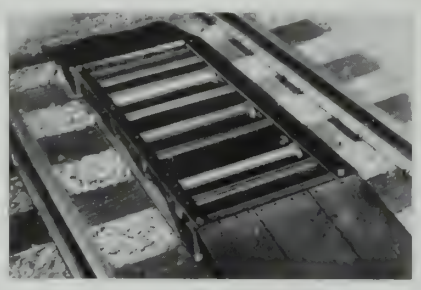
By Bradley Cochran

WHEN automatic train control advanced from the experimental to the service stage in 1922 and the years immediately following, a manufacturing plant on the Pacific Coast was among the first in the country to supply train control equipment commercially. This is noteworthy in view of the fact that the Pacific Coast is largely a consumer of railroad supplies procured in the East, rather than a producer of such articles.

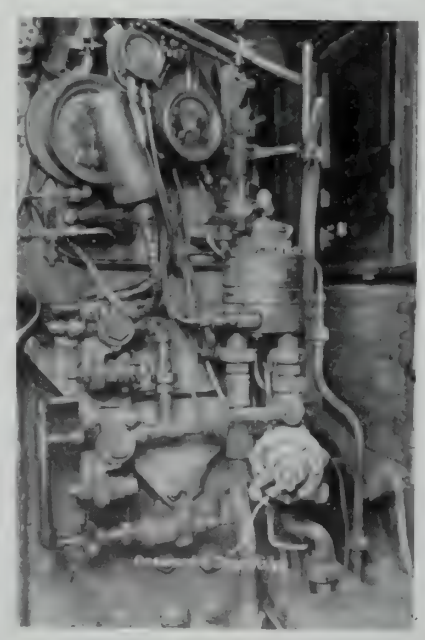
The National Safety Appliance Co. of San Francisco, with the hearty co-operation of the Western Pacific, and Southern Pacific railroads, had practically completed the development of its inductive system of train control, under operating conditions on main-line tracks, when the first train control order was issued by the Interstate Commerce Commission, June 13, 1922. As the development work progressed, the laboratory grew into a factory equipped for efficient production. The National Company was, therefore, in a position to manufacture and supply fully developed train control equipment as rapidly as it was required for installation on the 695 miles of track and 454 locomotives subsequently equipped with the system.

By reason of this timely development and preparation for manufacture on the part of the National organization, also, the Southern Pacific Company was enabled to make an exceptionally creditable record in its compliance with the commission's order. Aside from three roads which had train control in service prior to the issuance of the order, the Southern Pacific's divisions were two of only three divisions in the United States on which installation was completed at the time specified, January 1, 1925.

The factory, at 82 Mary street, San Francisco, is believed to be the only plant in the country devoted exclusively to the production of train control appliances in which practically all of the parts of these appliances are manufactured from the raw materials. With a select force of skilled mechanics, finished products of exceptionally high quality are turned out. The plant is equipped with a full complement of machine tools suited to the requirements of manufacturing all appliances for locomotives and track, including facilities for winding and impregnating track-magnet coils, for magnetizing and testing the permanent magnets, and for handling and assembling the product economically. Rigid inspection and test of the finished appliances form a particularly important part of the routine.



Track Magnet Unit With the Cover and One Side Removed

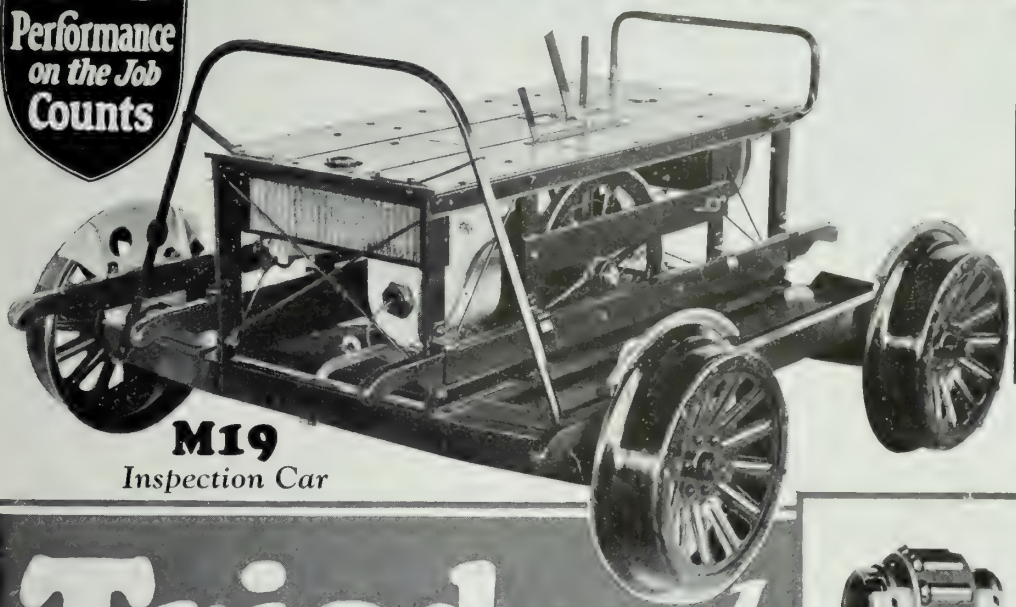


In the National system the control of the engine apparatus from the track is effected directly by magnetic induction. A control valve on the engine, normally held closed against air pressure by a small permanent magnet, is released by the magnetism from a track magnet in the center of the track. In the track magnet, permanent magnets normally supply the magnetism which acts upon the control valve, and electro-magnets, energized when the track ahead is clear, divert the magnetism of the permanent magnets, by "drawing" it through the electro-magnets, so that the control valve may pass over the magnet without being operated. Thus the magnetism is not suppressed by a force tending to weaken the permanent magnets.

A large number of these track magnets have now been in service for from two to four years, and periodical tests show that the permanent magnets do not lose strength. In view of that fact, and as the electro-magnets are energized by flow of current from an outside source, the system is operated on the "closed-circuit principle"; that is, when the block is clear, current must flow in the circuit to prevent action that will

Fairmont

Performance on the Job Counts



M19
Inspection Car

FAIRMONT RAILWAY MOTOR CARS

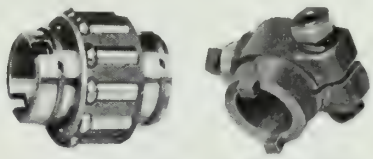
Inspection—M19

Light Section—M14

Section—A2, M2, S2

Gang—AT2, MT2, ST2

Tried *and* Proved Design



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In the wide variety of Motor Cars, Trailers, and Car Builders' Supplies which FAIRMONT makes, every part has been designed to give superior service.

To insure the utmost in efficiency and economy at all times, FAIRMONT products are kept modern and are constantly subjected to gruelling endurance runs to prove their service capacity at our expense.

The Fairmont Ringseald Roller Axle Bearing, illustrated above, provides proper axle lubrication at all times even in spite of human forgetfulness. It holds three times as much oil by means of a "piston ring" seal. This "piston ring" seal keeps the oil in and the grit out.

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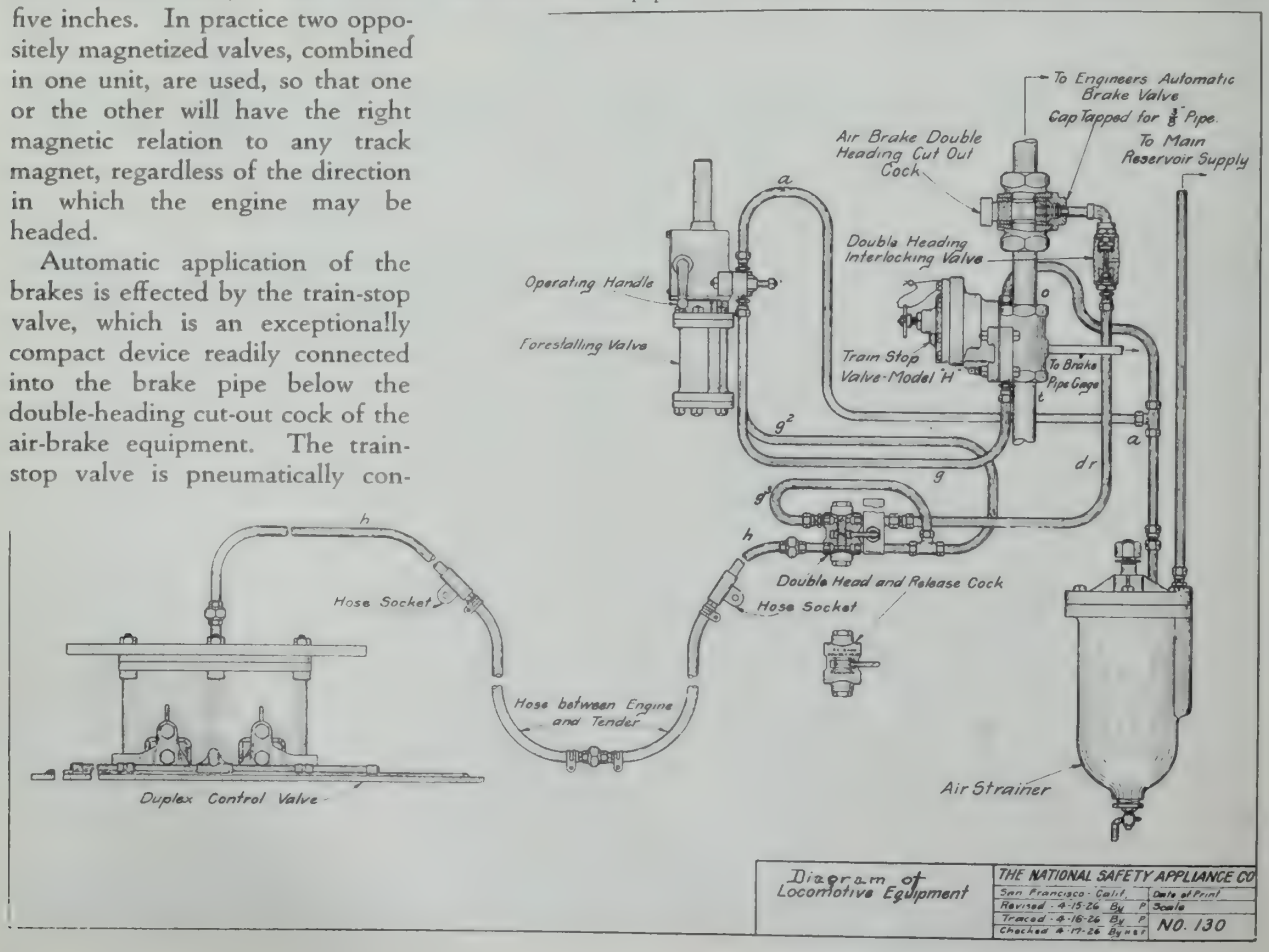
stop a train, and accidental interruption of the current, as by breaking or cross-connection of the wires leading to the magnet, will result in a "safe failure," leaving the magnet in condition to stop a train. The circuit to the track magnet is controlled by the signal system so that current flows to "neutralize" the magnet only when the block or signal is clear. As the magnet circuit is closed only when a train is approaching and passing, the required current is supplied readily by the local storage battery.

The control valve is mounted under the tender with a clearance of about five inches above top of rail. As the track magnet is entirely above the ties and its top is even with top of rail, the air-gap, through which the magnetism passes from the track magnet to the control valve, is also about five inches. In practice two oppositely magnetized valves, combined in one unit, are used, so that one or the other will have the right magnetic relation to any track magnet, regardless of the direction in which the engine may be headed.

Automatic application of the brakes is effected by the train-stop valve, which is an exceptionally compact device readily connected into the brake pipe below the double-heading cut-out cock of the air-brake equipment. The train-stop valve is pneumatically controlled by the control valve through a small pipe, with hose between the engine and tender. Opening of either control valve, when released by the influence of a track magnet, allows air to escape from the connecting pipe and so causes operation of the train-stop valve, which effects a service application of the brakes by venting air from the brake pipe. The train-stop valve is so constructed that when operated it prevents further supply of air to the brake pipe but does not prevent the engineman from increasing the brake application.

After the control valve is released by a track magnet, it is kept open by a continuing flow of air through the connecting pipe from the train-stop valve, until the flow is stopped by means of the release cock. As this cock is in such a place on the engine that it can be reached only from the ground an automatic brake application, once started, continues until the train is stopped. Movement of the cock to release position stops the flow of air through the control valve, which then restores itself, but continues the flow from the train-stop valve through a branch pipe, so that the latter valve is not re-



stored, and the brakes cannot be released until the release cock is returned to normal position. There is thus a check on any attempt to move the train with the release cock in a position to prevent the control valve from operating the train-stop valve. And yet, almost paradoxically, the release cock is used for that very purpose on a following engine in a train having more than one engine. On such an engine closing of the double-heading cut-out cock actuates the interlocking valve which closes the outlet from the branch pipe mentioned. The release cock is then placed and left in release position without affecting the train-stop valve except to prevent its operation by the control valve. The train control, therefore, operates only on the leading engine.

These devices are all that are required in the National system for the automatic stopping of a train, and for restoring normal conditions afterwards; and, from the safety standpoint, the vital function of automatic train control is to stop a train in case the engineman, because of being incapacitated or for any other reason, fails to take proper action when approaching a stop signal. But, in practical railroad operation, it is no less important to keep trains moving when they can proceed safely. Accordingly, one more appliance, the forestalling valve, is provided, by means of which the engineman can prevent an automatic application of the brakes when he is alert and ready to take the action indicated by a signal. For example, at a caution signal, if the engineman takes no action, the train control should and does start a brake application so that the train will be stopped before it reaches the stop signal ahead. But if the engineman observes the caution signal, he operates the forestalling valve just before the engine reaches the track magnet at that signal. Having thus prevented automatic action, he then handles the train as circumstances require, proceeding without a stop if the next signal clears in the mean time. Similarly, when it is necessary to pass a stop signal, in accordance with the rules, an operation of the forestalling valve prevents an automatic stop immediately after the train starts. The forestalling valve is entirely pneumatic in its operation and is "foolproof." It contains a timing device which automatically restores normal conditions fifteen or twenty seconds after it is operated; and it will not operate after an automatic brake application has started. Consequently it cannot be set to prevent automatic stops indefinitely, but must be operated just before a track magnet is passed; and it can not be used to prevent an automatic stop if the engineman neglects to act before the control valve opens.

From the description it will be seen that, with the exception of the magnetic holding and release of the control valve, all the engine apparatus is operated pneumatically. There are no electrical appliances whatever on the engine. The system goes straight to the essentials of automatic train control, and is not needlessly complicated at any point. For these reasons maintenance is both simple and low in cost. No other than air-brake men are required for the maintenance of the engine equipment and only a short period of instruction is necessary to qualify them for the work. Maintenance of the roadway equipment is, as would be expected, a still smaller item than that of the engine appliances.

Complete tests of the engine equipment are made every time an engine arrives at an engine house, and again when the engine leaves for its next run. In addition, tests are made at intervals under actual running conditions, by setting a track magnet at stop when the signal is clear. These tests simulate the condition of a train passing a caution or stop signal with the engineman dead in the cab, and prove the correct working of both track and engine appliances. No inconvenience results, other than the occasional trifling delay of a train; the automatic stop is made so smoothly that passengers are not even aware that the stop has not been made by the engineman. No failures to stop trains have occurred, and the slight delays due to the tests are more than offset by the evidence that the train control system is always operative under actual service conditions.

One of the Main Parts of the National Safety Appliance Plant Described in This Article

On account of the few pieces of apparatus and their simplicity, both installation and maintenance costs of the National system are low. They average: roadway installation, $1,000 to the mile of track; maintenance, $2 a mile of road monthly; equipping locomotives, $600 each; maintenance, $10 a month for a locomotive.

Enginemen were at first opposed to automatic train control.

But it is now seen that an efficiently working train control system is a benefit to the engineman, a friendly monitor. It is no secret that once in a long time a signal is overlooked and every sensible engineman, realizing that he is not infallible, feels a sense of security from having on his engine a device that will intervene to prevent possible serious consequences if he happens to miss a restrictive signal indication. During thick weather, if at no other time, the benefit of train control is realized. Not that enginemen go ahead whether or not they can see the signals; but great difficulty in seeing signals increases the chance that one may be missed. In fact, not only are the enginemen led to look with favor upon train control, but train control eliminates a definite hazard in train operation, where the view of signals frequently is obscured; as in territory where fogs are prevalent, and, still more, under the conditions that exist in snow sheds and tunnels.

A parallel case is found in the use of train control to safeguard movement of opposing trains by signal indications alone. On the Missouri Pacific the required installation of train control was turned to good account in that way. National train control was installed as part of a controlled-manual block system under which trains are operated on a single-track division by signal indications, without time-table superiority or train orders. The train control in this system eliminates the particular hazard of collision between opposing trains which might result from disregard of a signal where train movements are governed solely by the signals.

Mexican Shippers Organize

A shippers' advisory board has been organized in Mexico. This organization, the first of its kind in the history of Mexico, comes as a direct result of the success which the shippers' advisory boards in this country have made in handling car service disputes.

Rate Cuts Don't Help

T. D. Campbell of Montana, the world's greatest grain grower, thinks the present efficiency of the railroads is far more important to the farmers than any reduction in freight rates could be.

In fact the question of rates does not enter at all into the solution of the farm problem in his opinion, as this grain wizard sees it. Mass production and the application of mechanical engineering are Mr. Campbell's two suggestions for dealing with the situation confronting farmers. Units of farming, he says, must be larger, with tractors and up-to-date machinery.

"In fact," he says, "a 10 per cent reduction would mean a saving of only a few cents a bushel. We can send a bushel of wheat 1,200 miles or more for 20 cents. It cost the farmer almost as much for cartage, loss, etc., in getting it 20 miles to the railroad. The railroads give us tightly sealed dampproof and otherwise modern freight cars, which carry the grain without loss or deterioration to its destination at a fast clip."

How Are Prices Now?

How much have prices increased since the war?

What commodities have most increased in price, and what least?

Everybody knows there have been advances practically all along the line. But the comparative increases in prices of particular commodities or groups of commodities have had curiously little detailed analysis.

From a recent publication of the U. S. department of labor the accompanying figures are presented; the price index for 1913 is 100, and the comparison is for October last:

House furnishings	226.5
Anthracite	225.5
Bituminous coal	214.5
Brick	205.
Woolens & worsteds	189.
Boots & shoes	184.3
Lumber	181.6
Building Materials	163.6
Other fuels	157.4
Silks	154.4
Meats	154.3
Cotton goods	153.
Milk, cheese, butter	152.6
Other foods	151.7
Grains	142.5
Poultry	142.
Furniture	140.1
Farm Products	133.7
Structural steel	132.4
Gasoline	124.8

The department figures deal with wholesale prices, and show that for October, 1926, the index figure for average prices of all commodities was 149.7. That is, the dollar of 1913 had a purchasing power equal to 1.497 of today's money.

That gasoline should appear at the bottom of such a list is remarkable for two reasons. First, production of gasoline has increased over 900 per cent since 1913; and second, the crude petroleum, from which it is made, has greatly advanced in price. The index figure for California crude in October, 1926, was 314.3; that is, it has more than tripled in price since 1913. For Kansas-Oklahoma crude the index figure for October, 1926, was 219.4, showing it had more than doubled; and for Pennsylvania crude, the figure was 138.8.

It has been a persistent boast of the oil industry that among staples widely used and increasingly demanded, none showed so little evidence of profiteering as gasoline. The official figures as here given indicate also that none has since the war so nearly returned to the pre-war price level.

'Frisco Bay Bridge Plans

Three experts have been appointed in San Francisco to select a site for the long-discussed bridge across the bay. They are Robert Ridgway of New York, Prof. Talbot of the University of Illinois, and John D. Galloway of San Francisco. It is expected that a report on the location of the bridge, length of spans, type of structure and other engineering features will be forthcoming early in May.

From Walla Walla to St Paul

DISCONTENT has its compensations. Particularly for the man with an ambition. Of course some chaps would drive express wagons to the end of their lives, and never get outside the city limits, never see beyond the horse's ears—or the radiator, never have a dream, they sleep so soundly. Some men subscribe to the Ingalls theory that Opportunity knocks but once at every door, a silly idea, while others keep their eyes open and their ears cocked for the big noise which means that something is coming their way. Some men loiter along the way like truant schoolboys, never ready for the big chance when it comes. Others believe in preparedness, getting ready, studying their jobs and the next man's, watching the clock in the morning, and then forgetting it until the work in hand is done. Almost anyone can float down stream, but it takes what we now call intestinal stamina to swim against the current and win.

Claude Goodhue

Nothing very thrilling about driving an express wagon in Walla Walla, Wash., but that was the lowly job assigned to Claude Goodhue thirty years ago, when he quit high school in the little town with the double barreled name. The old Northern Express Co. gave him his start, but Claude cultivated it, and made it amount to something. He kept at it until 1902 when someone who knew a good man when he saw one made him chief clerk for the company at Seattle. The principal arguments up there in those days were over which town had the larger population, Seattle or Tacoma, and whether it was Mt. Tacoma or Mt. Ranier. Claude paid no attention to the fuss. He just worked away like the well-known Trojan who must have been a marvel, judging from all accounts, and one day, four years later, with the great discussion still undecided Claude was sent to Portland as chief clerk to the superintendent of the company's western division. Of course no one in Seattle would call it a promotion to be sent to Portland, but the young clerk didn't worry about that. He went on working until 1918 when he really began to work as claim agent for the company. In 1920 he entered the operating department, and became supervisor of express traffic for the Northern Pacific on the western division. He handled this job so efficiently that, not very long ago, the president sent for him, and made him supervisor of baggage, mail and express for the whole works, with the customary mahogany office in St. Paul. What do you think of that? In the passing years Mr. Goodhue has accumulated a wife and two daughters, and they're all living in St. Paul, which must make Minneapolis sore.

HUTCHINSON TRAIN INDICATORS

NEW MODEL SHOWING MAKE UP OF TRAINS

Railways Using Hutchinson Indicators

C. & A.
C. M. & St. P.
Penna.
C. B. & Q.
C. & N. W.
N. Y., N. H. & H
B. & O.
C. P. R.
Can. Nat'l.
Mich. Cent
Cent. of N. J.
Long Island
K. C. Southern
C. R. I. & P.
Santa Fe
Mo. Pac.
Ill. Cent.
Erie
D. L. & W.
Big 4
Monon
A. C. L.
Southern
Seaboard
Grand Trunk
Florida East Coast

Hutchinson—
the originator of Train Indicators, makes any type and size for any condition.

J. HUTCHINSON
80 Station Road
Great Neck, N. Y.

Citations for Quick Thinking

Complimentary citations and 30 merit marks on their service records after smashing up several cars of perishable freight does not happen very often in the experiences of railroad employes. But this was the case not long ago with Thomas S. Early, engineer, and James S. McGraw, fireman, for the Southern Pacific Co. Officially, the division superintendent, George E. Gaylord, cited the men for heroism in saving the life of a 2-year old child, Dorothy Terry, who had calmly seated herself on the track just as the Southern Pacific train, with 99 cars of lettuce, was rolling into Yuma out of the Imperial Valley. But actually the two men were cited for knowing what to do and how to do it in an emergency, a quality much needed in the railroad business.

Forty-nine cars back of him Engineer Early had a helper engine. When the child unexpectedly stepped on the track and seated herself it was impossible to get a signal back to this helping engineer. It seemed to Early impossible to do anything except what he immediately did: "take up the slack" in the train, and then apply the emergency brakes. The fireman then jumped and ran ahead, jerking the child from the track just in time. Early's good judgment consisted in using just enough air to "bunch" the cars and then using the emergency brakes reducing the speed enough to let Fireman McGraw beat the train to the child. Three cars of lettuce were so badly damaged that a wreck crew was needed to clear the track. The damage amounted to $500.

The ways of Providence are almost mysterious. The electric light business is increasing because radio fans stay up so late listening to the programs. Still, there are things one hears without light, except for the moon.

A New Bumping Post

If all yardmen were thoroughly competent; if all of them could stop a cut at just the right spot, bumping posts would not be needed. But there are many who can not or do not do this. So bumping posts must be used. They improve the operating efficiency. They save property. The latest dependable post comes from Indiana where the Hayes Track Appliance Co., of Richmond, makes the Type W which stops cars, the company says, without damage. Type W will fit any rail from 4 to 7 inches high, is easy to install, the work can be done by two men, and there are only 12 holes to drill in the track rails and these are for 1-inch bolts; no digging under ties is needed; the posts are firmly fastened to eight cross ties as well as to the rails.

JORDAN SPREADER
"Does the Work of an Army of Men"
SNOW PLOW ★ ICE CUTTER ★ DITCHER
UNIVERSALLY STANDARD
O.F. JORDAN COMPANY
WALTER J. RILEY, PRESIDENT
EAST CHICAGO, INDIANA

The JORDAN is an all-the-year-'round machine. It spreads materials, digs ditches, moves earth, rips out ice, fights snow.

Testing Concrete for Roadbed

The Pere Marquette is the Pioneer

By A. C. Irwin

A STRETCH of track one-quarter of a mile in length, carried on a reinforced concrete slab 10 feet wide and 21 inches thick, was opened to traffic recently on the Pere Marquette Ry.

This concrete slab has neither ties nor ballast intervening between it and the rails. The rails are fastened rigidly to the slab by means of holding-down bolts that pass through nuts held under steel stirrups embedded in the concrete. The slab itself is reinforced and is fully capable of transmitting the loads that come upon it through the subgrade in such a way as to distribute them over a large area of the subgrade. The reinforcement of these slabs consists of two longitudinal trusses immediately under the rail with longitudinal and cross bars in the bottom of the slab.

Reinforcing for Concrete Slabs in the Permanent Track Support, Near Beech, Mich.

The small longitudinal trusses under each rail will be seen to consist of two ¼-inch plates for the top chord and two light angles for the bottom chord with light channels for posts connecting the top and bottom chords. The original purpose of these trusses was to form a part of the rail seat, and to provide a rigid support and alignment for the stirrups and holding-down bolts while the concrete was being placed. It was found, however, that these trusses coming from the shop were too crooked and too uneven to be used for rail seat, and the concrete consequently was finished about ¼-inch higher than the plates.

This experimental track is in service just west of Beech on the Plymouth division of the Pere Marquette Ry. It is in double track, block signal territory. The only interference with traffic during construction was the observance of a slow order, since a long passing siding was available for use as a second track during the time the west bound main line was put out of service for construction of the concrete slab.

After the diversion of traffic, the rails and ties on the experimental stretch of track were removed and the ballast taken off to level with the bottoms of the ties. An attempt was made to roll this subgrade but the gravel ballast in between the locations of the ties, where it had been compacted by traffic started waves in the subgrade which soon caused the roller to break up the entire surface of the ballast, and so retard the progress of the roller that it was taken from the subgrade with difficulty. Thereafter the old ballast was simply leveled off at the bottom of the ties, and a coating of grout about ¾ of an inch thick spread over this leveled-off surface. The object of the grout is to prevent adhesion of the concrete slab to the ballast in case it ever is desirable to level up the slabs by

The Rails in Place on Concrete Slabs, Looking East Near Beech, Mich. No Ties Nor Ballast Needed Here

jacking them up, and forcing grout in under them through the 1¼-inch pipes embedded in the concrete.

The forms, of course, consisted only of the side forms and a dam at the end of each 39-foot length slab section. The small trusses were supported on stakes driven through the grout into the subgrade. These stakes were positioned accurately both as to line and grade, and final adjustment of the top of the trusses made by means of wedging in the adjustment rods passing through the top chord of both trusses, and having long threads on each end for use in regulating the spacing of the top chords of the trusses by the simple process of turning nuts on each side of the plates. The alignment and elevation of these trusses was set by use of transit and level.

The joint between each section of the slab was formed by sheets of galvanized iron, bent to form a key 6½ inches deep and 3 inches wide between adjoining slabs. The upper half of this joint was fitted with a strip of Elastite.

The concrete was mixed with a quantity of water designed to produce 4000 lbs. concrete at 28 days under normal conditions. However, the work was done during October and November, and there were very few nights when the temperature did not get below freezing. Toward the end of the work the water and aggregates were heated.

One of the principal recommendations for a rigid type of track construction is improvement in the surface and line of the track. In this case, there is nothing between the rail and the concrete excepting a sheet of five-ply Fiberock which was used solely because of the necessity of insulating the rail from the steel trusses under them, since the latter are definitely connected to each other, and thus would make normal operation of the track signals impossible. The finishing of that part of the concrete slab under the rail was, therefore, of prime importance and, while no expert finishers were on the job from its beginning to its end, the surface of the concrete is quite smooth and true. The rail seat surface was improved by the use of rough grain carborundum brick. This entire carborundum rub, however, required only an insignificant amount of labor.

The experiment will give more definite and convincing information on the moot question as to whether it is practicable or possible to support the rails of high speed steam railway track on a rigid material without destruction of the support or the rails from the dynamic effects of impact. It will give also some indication as to the riding qualities of the rigid type of track construction. While it is true that street railway track has been embedded solidly in concrete for many years, this installation is the first case on record of the use of a concrete slab under high speed railway track without the intervention of ties or ballast or both between the rails and the support.

View Showing the Grouting Process in the Leveled Subgrade, Concrete Permanent Track Support of the Pere Marquette

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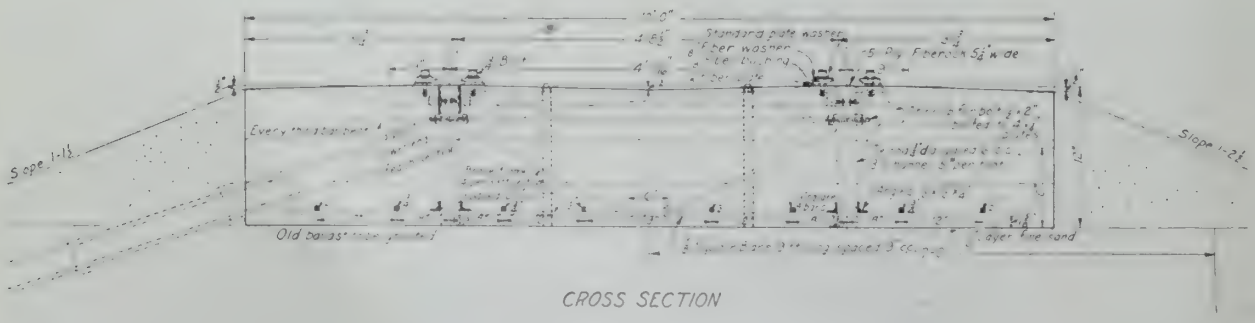
"Now is the time; this is the hour; here is the moment of the best day in your life. Make good use of it."



The Engineer's Profile Showing How the Permanent Track Support is Designed in Detail; An Important Experiment in Track Economy Which the Pere Marquette Has Started

H. M. Adams to the Western Pacific

C. M. Levey A Director

H. M. Adams, New President of the Western Pacific Ry.

CHARLES M. LEVEY, president of the Western Pacific Ry. Co., retired from that office April 1. He was succeeded by Harry M. Adams, now vice president in charge of traffic for the Union Pacific System. While it was Mr. Levey's wish to retire from active duties he is to continue his connection with the Western Pacific as assistant to the chairman of the board and as a director.

Mr. Levey had planned for more than a year to give up his post as president but when the control of the Western Pacific was acquired by Arthur James of New York he decided to continue the connection he had assumed with the road in 1909 until the new owners were ready to relieve him without creating unnecessary confusion.

The story of Charles Levey's rise in the railroad world is another instance of the romance of railroading, pretty familiar to those who know the history of the industry. He was born in 1858 near Olean, Mich. At 15 he became a telegraph operator for the Michigan Central, and a year later went to the old Burlington & Missouri River as night operator at Red Oak, Iowa. Since then he has been in many departments of transportation, clerk, agent, general agent, train master, superintendent's chief clerk, superintendent, general manager, assistant to the president, vice president, and finally general manager of the Western Pacific and later, in 1916, its president. During these years he has been with the Chicago, Burlington & Quincy and its subsidiary lines, and with the Northern Pacific as third vice president.

Harry M. Adams, who succeeded President Levey, was born at Comanche, Iowa, in 1867. Like Mr. Levey, he came up from the bottom of the ladder, occupying on the way many positions in the station service on the old Kansas City, Fort Scott & Gulf, which is now part of the Frisco system. Mr. Adams also has been a clerk in the baggage department, in the freight division and, for a complete change, was at one time advertising agent for the Union Pacific.

In 1893 and 1894 Mr. Adams was in South America, but upon his return once more entered the railroad field, again with the Union Pacific as a ticket clerk, and from that time has worked his way up through the freight and passenger departments to his present position. In 1898 he was general agent for the Oregon Railway & Navigation Co. at Spokane, and in 1902 became assistant general freight agent at Portland, Ore. In 1905 he was made assistant traffic manager of the Great Northern at Seattle, and two years later became general freight and passenger agent for the Spokane, Portland & Seattle Ry. at Portland. Mr. Adams was freight traffic manager for the Western Pacific at San Francisco from 1910 to 1914, when he became general traffic manager for the Missouri Pacific at St. Louis. In 1917 he was elected vice president of that road. For one year he was chief of inland traffic service for the war department in connection with the United States Railroad Administration at Washington, and in the latter part of 1919 was made traffic assistant to the regional director of the railroad administration at St. Louis. He was elected vice president in charge of traffic for the Union Pacific system October 1, 1919.

With the new president in command the Western Pacific already has launched an aggressive campaign of competition for new intra and interstate and transcontinental business, aided by new construction, reconstruction and joint traffic agreements. Included in

Charles M. Levey

the plans is an extension of the line from its present San Joaquin Valley terminus at Hilmer to Fresno; construction of a depot and terminal facilities at Fresno to cost $300,000; shortening of the present route from San Francisco to Sacramento from 97 to 87 miles, and joint use of the Moffatt tunnel in Colorado, cutting 175 miles from the distance between San Francisco and Denver, with the object of making the time between Chicago and the coast the fastest on any line.

Extension of the San Joaquin Valley line to Fresno means the addition of about 100 miles of track and will involve changing the present electrified subsidiary, Tidewater Southern, into a steam line. Shortening of the Sacramento line will be accomplished through a new cut through Alameda and Contra Costa counties, tapping the Sacramento short line, also owned by Western Pacific near Walnut Grove. Short line rolling stock and roadbed will have to be virtually reconstructed to care for heavy traffic, but President Adams and the board of directors deem the project worth while.

The Moffatt tunnel will be used jointly with the Denver and Salt Lake system and from Denver east Western Pacific traffic will be routed over the Chicago, Burlington & Quincy in lieu of the Missouri Pacific, as at present.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

Railroad Clubs to Have Annual Dinners

The Western Railway club will hold its annual dinner at the Hotel Sherman, Chicago, May 17, and the New England Railroad club at the Copley-Plaza Hotel, Boston, May 10.

Motor Buses for Westchester County

Plans are under way for electric railway abandonment in the Sound section of Westchester, and the installation of motor coach service throughout this area. Port Chester, N. Y., is the projected hub of the system. The carhouse of the New York & Stamford Ry. in Port Chester is being converted into a modern terminal garage that will house upward of 74 motor coaches. During March the County Transportation Co., a subsidiary of the New York, Westchester & Boston, appeared in the field of motor bus transit. April 3 the local railway lines of the New York & Stamford Ry. in Port Chester were abandoned and motor coach service installed. April 14 the County Transportation Co. installed motor coach service for Milton Point in the Rye-Harrison-Rye Beach section of the county.

San Francisco to Buy New Cars

The public utilities committee of the council of San Francisco, April 15 postponed until its next meeting action on a recommendation by the board of public works that $290 000 be set aside to buy 15 new cars for the projected Judah street line of the Municipal Railway.

Pennsylvania's Foreign Tickets

The Pennsylvania announces Thos. Cook & Son have become general foreign passenger agents for that road. In their offices throughout the world (other than North America) Thos. Cook & Son will place at the travelers' disposal every facility of their travel service combined with all the services of Pennsylvania ticket offices.

Auto Truck and Bus Production

A statement released April 21 by the department of commerce, based on reports received from 123 manufacturers in the United States, show that in the first three months of this year 120,417 trucks were produced (factory sales) compared with 103,970 in the same period of 1926. The department includes ambulances, funeral cars, fire apparatus, street sweepers and buses in the classification of trucks.

Aircraft Wing Testing Device

H. H. Kelly, trade commissioner at Paris states that a new invention described as an indicator for detecting wing stresses for use on aircraft was described to the French Academy of Sciences at Paris March 28. This device not only serves as an indicator of the deformation of wings in flight but can also indicate to the pilot when a wing begins to suffer dangerous stresses thus permitting a landing before a complete failure occurs. It was stated that instantaneous failure of a wing is extremely rare, and that a break is almost always preceded by a weakening of the structure which can be detected by this new instrument. Details of a second invention, a "movie-machine-gun" which traces an accurate record of the aerodynamic qualities of airplanes, was also explained to the academy.

Highway Assessments Reduced

Assessments against the Missouri Pacific by road improvement district No. 1 of Franklin County, Ark., for a new highway obviously were arbitrary and excessive. So the United States Supreme Court held, April 18, thus upholding the lower court, although the case was reversed and remanded with instructions for new proceedings to determine the amount the railroad properly might be charged. The assessment was $75,686 and the Supreme Court holds that it should not have been in excess of $15,000. Rolling stock and other equipment of the railroad were included in the assessment. The high court held that while the railroad will benefit by the highway, in increased traffic, it also will have losses through automobile competition. It is left to the lower court to determine how much, within the maximum of $15 000, the railroad should pay.

The February Fuel Bill

The Interstate Commerce Commission's monthly summary of railroad fuel statistics shows that the average cost of railroad coal was $2.69 a ton as compared with $2.62 in February, 1926. The figures the commission uses include only fuel for road locomotives in freight and passenger service charged to operating expenses for Class 1 steam roads, not including switching and terminal companies. The average cost of fuel oil was 2.98 cents a gallon, as compared with 2.90 cents last February. For January and February the average cost of coal was $2.71 and the average cost of oil was 2.98 cents. The total cost of coal and fuel oil for the two months was $56,731,491, as compared with $55,441,805 in 1926.

U. P. Acquires Bus Company

The Utah Parks Co. of the Union Pacific System has purchased the Utah & Grand Canyon Transportation Co. from its former owners, the Parry brothers. The company operates from Zion National Park and Bryce Canyon to the north rim of the Grand Canyon, in the Grand Canyon National Park.

Chicago's Traction Fund

Nearly $50,000,000 is now held in the traction fund of Chicago as a result of the payment April 9 of $2,617,399 to the city comptroller by the Chicago Surface Lines. The amount represents 55 per cent of the net earnings of the Chicago Railways and the Chicago City Railway for the year ended Jan. 31, 1927. The check from the Chicago Railways, which is now in the hands of receivers, was for $1,631 030, while that of the Chicago City Railway was $986,368.

Under provisions of the ordinance of 1907 funds are to be used either for purchase of the lines by the city or for

municipal subway construction. With the payments for last year and $350,000 in accrued interest, the traction fund now amounts to $49,747,019.

Kankakee Line Quits

W. W. Crawford, receiver of the Chicago & Interurban Traction Co. has announced that service over its 54-mile route between 63rd street, Chicago, and Kankakee, was discontinued April 23. The Illinois commerce commission approved the abandonment in an order entered March 9 and the circuit court of Cook county confirmed the authority in an order issued by it April 12.

High operating costs and falling revenue due to the competition of automobiles and motor trucks and the greatly improved suburban service furnished by the Illinois Central as a result of electrification are cited by the receiver as the reasons for the failure of the company to meet operating charges.

Reading Seeks Bus Charter

The Reading Transportation Co. bus subsidiary of the Reading Company, Philadelphia, has filed an application for a charter with the public service commission. This is the second attempt to incorporate the company. The railroad plans to operate a fleet of buses in 24 of Pennsylvania's counties. No permits to operate are involved, the action being incorporation proceedings.

Former Governor Pinchot refused the previous application of the company for a charter, alleging that it would develop into a monopoly. Capital stock of the new company is fixed at $1,000,000

Activities of Imperial Airways, Ltd.

From April 1, 1924 to December 26, 1926, 2,358,050 miles were flown on cross-channel trips. 38,229 passengers and 2,117 tons of freight were carried. In a recent monthly bulletin issued by Imperial Airways Ltd., attention is drawn to the fact that the network of air connections which now link up all important cities of Western Europe enables passengers during the summer to make extensive tours of Europe in a shorter time than has hitherto been possible. The airway tour habit is growing.

C., N. S. & M. Traffic Increases

According to the annual report of the company, substantial progress was made in 1926 by the Chicago, North Shore & Milwaukee R. R. The volume of traffic, both passenger and freight, was the greatest in the history of the company. Gross revenue showed an increase of $718,197 over the previous year. The net income showed a decrease from the previous year of $49,203, owing to increased fixed charges resulting from heavy capital expenditures for additions to the physical property, particularly the building of the Skokie Valley route. In 1926 the company carried 19,461,426 revenue passengers on its rail and auxiliary motor coach lines, an increase of 1,232,266 over the previous year. The freight business of the company totaled 656,754 tons, an increase of 120,659 tons over the previous year. The company added to its rolling stock during the year twenty steel passenger coaches, three dining cars, five refrigerator cars and 24 freight cars. It now has a fleet of 47 motor coaches.

Cleveland Railway To Expand

The Cleveland Railway has been authorized by the Ohio utilities commission to issue $2,904,600 in capital stock at $100 a share plus accrued interest. The money raised by the sale of the stock is to be used for extensions and improvements including the buying of buses and cars.

Aviation Records in Australia

Passenger planes have flown a million and a half miles in Australia without accident, according to the comptroller of civil aviation. The Larkin service, covering routes totaling 1,000 miles, was started June 2, 1924, and has made 2 714 separate flights, totaling 337,446 machine miles and occupying 4,363 hours in the air; 1,659 passengers have been carried 193,332 passenger miles, and 19,921 letters and 438 pounds of cargo have been carried to the end of December, 1926. Western Australia Airways, on a 1,467 mile route since December, 12, 1921, have made 4,302 flights, involving 725,063 miles in 9,571 hours. Passengers carried numbered 3,536 for 638,883 passenger miles with 860,769 letters and 88,230 pounds of cargo. Queensland and Northern Territory Air service, on an 825 mile route since November 2, 1922, made 3,192 flights, totaling 320,953 machine miles in 4,116 hours, carrying 3,745 passengers for 361,541½ passenger miles, with 69,799 letters and 39,174 pounds of cargo.

P. E. Authorized to Sell Land

The Pacific Electric Ry. has been authorized by the California railroad commission to sell to the Pacific Electric Land Co. for $126,000 a number of parcels of land along its Newport Beach line, partly in Long Beach, and partly in Seal Beach.

Paper on Buses to be Read

F. H. Swentzel, mechanical superintendent New England Transportation Co., Providence, R. I., will read a paper on mechanical operation of buses and trucks by railroads before the annual convention of the Division V., American Railway Association, to be held at Montreal June 7-10.

Santa Fe Buys New Lines

Stockholders of the Atchison, Topeka and Santa Fe Ry. Company today approved acquisition of the capital stock, indebtedness and leases of the following short-line railroads:

Corona & Santa Fe Ry. in California.

Fresno Interurban Ry., in California.

New Mexico Central Ry. in New Mexico.

Headlton & Santa Fe Ry. in Oklahoma.

The stockholders have re-elected four directors: Howel Jones, Topeka; Arthur T. Hadley, New Haven, Ct.; Charles Steele, New York, and Henry S. Pritchell, New York.

Herrin's Job Abolished

The Southern Pacific Co. announces the office of vice-president and chief counsel of Pacific lines, made vacant by the recent death of William F. Herrin has been abolished. Charles W. Durbrow, Herrin's assistant, has been appointed valuation attorney of the Pacific lines and Guy Shoup, Herrin's other assistant, continues in the post of general solicitor, reporting to President William Sproule and A. T. Blair, general counsel for the company in New York.

Chicago Traffic Club Moves

Arrangements were made by the Traffic Club of Chicago to move to the Palmer House Monday, May 2. The club's new quarters will be on the fifth floor, State street side. The formal inauguration of the new officers will be held at the annual meeting May 16.

T & P Has Good Year

More profitable business for 1926 than in 1925 is reported by the Texas & Pacific, total operating revenues amounting to $35,449,650, an increase of $176,751. Freight revenue gained $505,148 to $26,556,341, but passenger revenue decreased $451,109 to $610,784. Net income was $3,927,340, an increase of $105,785. During the year 34 additional industries were located on the line. New equipment and improvements cost $686,390.

March Earnings Show Increase

Net operating income of the first fifty-three railroads to report March earnings aggregated $70,745,000 against $68,068,000 in March last year and $54,085,000 in February this year. Gross revenues were $425,901,000 against $426,459,000 a year ago.

New Train Indicator

A new type of train indicator for stations has been introduced recently by J. Hutchinson. One panel gives the name of the train, the time at which it leaves, the number of the track, and if run in sections the section number. An adjoining panel gives the Pullman car numbers in the order in which the train is made up.

Bus Line Authorized

The California railroad commission has granted a certificate to the Napa Valley Bus Co. to operate auto stage service connecting Calistoga, and Vallejo, to be coordinated with train service by the San Francisco, Napa & Calistoga Ry., of which the bus company is a subsidiary. It is proposed to operate bus service in place of a number of non-profitable trains during the off-hours of traffic, as a matter of economy to the railway and of convenience to the public.

Railway Construction

Tracks and Yards

CANADA.—Premier Howard Ferguson has announced the Ontario government will spend $2,500,000 this year on extensions to the Temiskaming & Northern Ontario. Approximately $1,500,000 will be spent on the extension toward James Bay, and the remainder in building the Swastika-Kirkland Lake branch line into the Rouyn mining region.

COLORADO.—The Denver & Rio Grande Western let a contract covering the revision of line between Parkdale, Colorado and Cleora, 42 miles, at a cost of about $750,000 to the Platt, Rogers Construction Co. A contract for the revision of the line between Mack, Colo., and West Water, Utah, 16 miles, has been awarded to the Utah Construction Co. Approximate cost, $539,000. This company is asking for bids for line revisions between Minturn, Colo., and Eagle, 26 miles; between Brown Canon, Colo., and Buena Vista, three miles, and in the vicinity of Husted, Colo., two miles.

GEORGIA.—The Georgia & Florida has awarded a contract for a 57-mile extension from Augusta, Ga., to Greenwood, S. C. at which point a connection with the Southern, Seaboard Air Line, and the Piedmont & Northern will be made. An outlet from the East to the Middle West will then be given.

ILLINOIS.—The Toledo, Peoria & Western has received authorization from the I. C. C., to build a line from its present line at Iowa Junction, Ill., to a connection with the Santa Fe at Lomax, about one mile. The Santa Fe will pay half the estimated cost, $64,030.

KANSAS.—The Santa Fe and the Kansas highway commission have reached an agreement to eliminate a grade crossing at Zarrah, by building a viaduct with a clear span over a six-track width. The railroad will bear 25 per cent of the cost.

MARYLAND.—The Castleman Valley R. R. has applied to the I. C. C. for authority to construct 3½ miles of additional branch line from a point near Grantsville to near the Pennsylvania state line.

MICHIGAN.—The freight classification yard of 4000 cars' capacity which the Grand Trunk is planning to construct on the line of its subsidiary, the Detroit, Grand Haven & Milwaukee at Detroit, will be operated in conjunction with the recently constructed yard at Pontiac, Mich. In the future, transfer engines will move all freight into Detroit from Pontiac. The yard at Detroit will involve the expenditure of $1,000,000, including a 20-stall enginehouse, a coaling station, a water station and facilities for light running repairs. The enginehouse and other buildings will be built by contract. The yard will be constructed by the road's own forces.

—The Pere Marquette has an extensive construction program for this year, involving an expenditure of over $2,000,000. Grade separations at Michigan avenue and Miller road, Detroit, will cost $320,000. The completion of the Schaefer road work in Fordson, 1927 portion, miles of tracks will be ballasted at a cost of about $307,000; ditching and widening cuts and fills on the various divisions, $162,500; bridges, trestles and culverts, $66,000; passing tracks and sidings, $363,000.

MISSOURI.—The Wabash has prepared plans for a steel and concrete viaduct to carry the tracks of the company across Vandeventer avenue at Market street, St. Louis.

NEW JERSEY.—The Pennsylvania has awarded a contract for raising and supporting tracks at the proposed undergrade bridge at Overbrook Terrace, Collingwood, N. J., to the Daniel S. Bader Construction Co., Atlantic City.

—The Lackawanna has let a contract for third and fourth tracks from Boonton, N. J., to East Dover at a cost of about $3,000,000, to Arthur McMullen Co. of New York City and the Strange Construction Co., Philadelphia.

NEW YORK.—The New Haven will relocate two main line tracks at Harlem River, New York City, at an approximate cost of $250,000 in preparation for a projected yard extension.

—Elimination of the highway grade crossing at County highway No. 677 has been ordered by the public service commission and the New York Central has been instructed to prepare plans and specifications; estimated cost, $214,000.

—The New York Central has awarded contracts for grading temporary tracks at Dyckman Junction to the Arthur McMullen Co.; also contracts for work to be done in connection with the west side improvements in New York City. This road has also let a contract for riprap walls along the Hudson River at Croton to O'Brien Bros., Inc.

—The public service commission of New York state has issued an order looking to the elimination of all existing grade crossings in Elmira on the Pennsylvania and the Erie roads. The estimated cost is around $4,000,000. The city has agreed to pay a maximum of $1,500,000 for work, including the crossings on the D. L. & W., concerning which the commission has not yet taken action. The present order directs the railroad companies to prepare plans and estimates, and to carry out the work of constructing the approaches.

NORTH CAROLINA.—The Piedmont & Northern has asked the I. C. C. for authority to construct a line from Charlotte, N. C., to Winston-Salem, N. C., 75 miles; and a line from Spartanburg, S. C. to Gastonia, N. C., 53 miles. Later reports state that this application has been withdrawn and that the company plans relocating the proposed extension.

OKLAHOMA.—The Rock Island Lines have announced they will construct new passing and storage tracks, aggregating several miles in length, at 18 points east of El Reno in the new Seminole oil fields. The new tracks are required to handle the rapidly increasing oil traffic in that section. The localities where the new tracks will be laid include such points as: Tracy, Tidmore, Seminole, Lima, Wewoka, Holdenville, Agua, Tecumseh Jct., El Reno, Stuart, Calvin, Shawnee, Harrah, Dickson, Oklahoma City, Council, Yukon and Banner, Okla.

—The Clinton & Oklahoma Western has asked the I. C. C. for authority to construct an extension from Cheyenne, across the Texas state line to a point near Pampa, Texas.

OREGON.—The Southern Pacific is constructing a concrete mud shed one mile south of Cinzette on the Cascade line, on the west approach to the crossing of the Cascade Mountains, to cost about $185,000.

—The Great Northern has asked the I. C. C. for permission to build a line from Bend to Klamath Falls in lieu of the previously proposed extension of the Oregon Trunk Ry. Ralph Budd, president of the Great Northern, said that the Oregon Trunk, jointly owned by the Great Northern and the Northern Pacific roads, had withdrawn its request for permission to extend its line to Klamath Falls.

PENNSYLVANIA.—The Pittsburgh & West Virginia has asked the I. C. C. for authority to construct a 38-mile extension from a point near Cochran's Mill, on the line of the West Side Belt, which it controls, to Connellsville.

—Immediate extension of nine trolley and bus lines in various parts of Philadelphia is part of a recommendation made to the public service commission, April 19, in a report filed by its bureau of engineering. The extensions cited as vital in 1927 would entail a capital outlay of $519,300 by the Philadelphia Rapid Transit Co. and additional operating costs of $287,950 a year. The report follows a three months' survey of the transit situation. The carrying out of the plans would require 32 additional cars and two buses.

SOUTH CAROLINA.—See item about Piedmont & Northern under North Carolina.

—See item about Georgia & Florida under Georgia.

SOUTH DAKOTA.—The Chicago & North Western has received authority to build a branch line in Butte county. The new line will extend from a point near Nisland in a general southeasterly direction for about 12.7 miles. The estimated cost is $387,400.

TENNESSEE.—The Nashville, Chattanooga & St. Louis has been authorized to construct a branch line from a point on its Sequatchie Valley branch at mile post 33.4 in a general southwesterly direction, about one mile. The estimated

cost is $23,700 for the branch line and $14,800 for yard tracks.

TEXAS.—The Louisiana Railway & Navigation Co. is said to be planning to rebuild the line between Greenville and McKinney, 32 miles, and to extend its line from McKinney, Texas, west to some point on the line of the St. Louis-San Francisco—either Celina, Texas, Frisco or Prosper—about ten miles.

—The San Antonio & Northwestern has filed charter in Texas for a line to be built between San Antonio and San Angelo, 234 miles, and application will be made to the I. C. C., for authority to proceed with construction.

—See item about Clinton & Oklahoma Western under Oklahoma.

—The city commission of Dallas has granted the Missouri-Kansas-Texas the right to construct an extension into the South Dallas industrial district, to cost about $100,000.

Buildings and Structures

CANADA.—Belleville, Ont. The Canadian National has awarded a contract to the Canadian Engineering and Contracting Co., Hamilton, Ont., for a 300-ton reinforced concrete coaling station.

—Paris, Ont. The Canadian National has awarded a contract to N. McLeod Ltd., Toronto, Ont., for a 300-ton reinforced concrete coaling station.

—Trail, B. C. The Canadian Pacific will erect a brick and stucco combined passenger and freight station.

—Waterton Lake Park, Alberta. The Canadian Rockies Hotel Co. Ltd., a subsidiary of the Great Northern, has awarded a contract to Oland & Scott, Cardston, Alberta, for a hotel to cost $500,000. This will be the first unit of a 250-room hotel.

COLORADO.—Grand Junction. The Denver & Rio Grande Western has placed a contract for a standard "N & W" type electric cinder plant with Roberts & Schaefer Co., Chicago.

—Minturn. The Denver & Rio Grande Western has awarded a contract to Roberts & Schaefer Co., Chicago for a standard "N & W" type electric cinder plant.

CONNECTICUT.—New Haven. The New Haven is having constructed at its Cedar Hill yard, the largest modern reinforced concrete locomotive coaling and sanding plant in the world. The plant will have an elevated bin capacity of 2,400 tons, designed to coal locomotives on five tracks with duplicate 150 tons an hour Simplex automatic electric elevating skips. This plant replaces the previous wooden facility destroyed by fire. Roberts & Schaefer Co., Chicago, is constructing the plant. This line has also awarded a contract for a central boiler plant to cost approximately $500,000 to Henry R. Kent & Co., Rutherford, N. J.

ILLINOIS.—Argo. The Indiana Harbor Belt has awarded a contract to Roberts & Schaefer Co., Chicago, for a Junior "N & W" type combined engine coaler and cinder handling plant.

—South Chicago. The Elgin, Joliet & Eastern has awarded to G. A. Johnson & Sons, Chicago, contract for a one-story brick and concrete dormitory to cost about $25,000.

INDIANA.—Lafayette. The Monon has awarded a contract to A. E. Kemmerer of Lafayette, for a brick and structural steel locomotive repair shop. The shop will contain 15 locomotive pits, two 15-ton cranes and one 210-ton bridge crane, and will cost about $275,000.

—Terre Haute. The Pennsylvania has awarded a contract for the sub-structure of a bridge over the Wabash River, to cost about $260,000, to the Dravo Contracting Co., Pittsburgh.

KANSAS.—Augusta. The Santa Fe is said to be planning an earth dam with concrete core wall to form a reservoir with a capacity of 462 million gallons of water, with a 12-in. gravity supply line, 33,700 ft. long, to carry the water to the yard and terminal. A pump house, treating house and tank, storage tank, service tank and water cranes will be constructed.

—Osawatomie. The Missouri Pacific is constructing a reinforced concrete automatic electric coaling station with two bins, one of 450 tons capacity and the other of 100 tons.

MARYLAND.—Germantown. The Baltimore & Ohio has awarded a contract to the Vang Construction Co., Cumberland, for a second main track and platform to cost about $13,500.

MASSACHUSETTS.—Lowell-Fall River. The New Haven has purchased two sand handling and drying plants from Roberts & Schaefer Co., Chicago.

—Worcester. The Boston & Albany has given a contract to Fairbanks, Morse & Co., for a new coaling and sanding plant.

MICHIGAN.—Bay View. The Pere Marquette will construct a waiting room and platform to cost about $13,500.

—Channing. The federal court at Chicago has authorized the St. Paul to construct an addition to the power house and machine shop, to cost $31,000.

—Detroit. The Pere Marquette is contemplating spending $90,000 for water treating plants and coaling stations this year.

—Grand Haven. The Pere Marquette will construct a station and team tracks to cost $35,000.

—Saginaw. The Pere Marquette has the following work scheduled for this year: Additions to machine shop, $45,000; remodeling forge shop, $15,000; car repair shed, $15,000; extensions to storehouse and offices, $80,000; reclamation plant, $8,000 and a heating plant to cost $5,000.

MINNESOTA.—Minneapolis. The Great Northern has awarded a contract for a reinforced concrete and steel highway bridge over the right of way of that company and the Minneapolis & St. Louis at Laurel avenue, to the Industrial Contracting Co., Minneapolis, to cost about $100,000.

MISSISSIPPI.—Holly Springs. The St. Louis-San Francisco has awarded a contract for a one-story tile and stucco passenger station to the Gerhardt Construction Co., Cape Girardeau, Mo., to cost $45,000.

—Jackson. The New Orleans Great Northern, it is reported is considering the construction of a two-story brick freight station with concrete platforms.

MISSOURI.—Chillicothe. The St. Paul has been authorized by the federal court at Chicago to replace a bridge over the Grand River, to cost about $87,000.

—Excelsior Springs. The Wabash is constructing a one-story brick passenger station.

MONTANA.—Missoula. The Northern Pacific is said to be considering reconstructing the bridge over the Rattlesnake River, near Missoula. Estimated cost, $36,000.

NEW JERSEY.—Hoboken. The Lackawanna is having plans prepared to enlarge and remodel the lunch room in the Hoboken terminal. The work, it is estimated, will cost about $50,000.

—South Amboy. The Pennsylvania has purchased from Roberts & Schaefer Co., Chicago, a Simplex automatic electric coal handling plant.

NEW YORK.—New York City. The New York Central has awarded a contract to the Tucker Construction Co., Inc., New York, for a driveway and loading platform about the 43rd street driveway, and for alterations to the Hotel Commodore receiving room.

OHIO.—Cleveland. The Pennsylvania has let a contract for the renewal of wooden piles and dock superstructure, to the Newhall Co.

—Portsmouth. The Norfolk & Western has awarded a contract for buildings in its car repair yard to J. P. Pettyjohn & Co., of Lynchburg, Va. The improvements are to cost about $30,000.

—Riverside. The Big Four has awarded a contract to the Ogle Construction Co., Chicago, for a 500-ton four-track electrically operated reinforced concrete coaling station. Riverside is near Cincinnati.

—Takeski and West Junction. The Baltimore & Ohio has given a contract to Bates & Rogers Construction Co., Chicago, for two bridges. Another contract has been given to James F. McCabe Co., Baltimore for five bridges on the Ohio division, to cost about $60,000.

—Youngstown. The Baltimore & Ohio has awarded contracts to the Ogle Construction Co., Chicago, for a 600-ton concrete electrically operated four-track coaling station; two three-track electrically operated cinder plants: a 2500-ton concrete sand handling plant. The structures are to be erected at Ohio Junction which is near Youngstown.

PENNSYLVANIA.—Philadelphia. The Baltimore & Ohio is planning to improve its terminal facilities at a cost of about $8,000,000. The work includes a new station, adjustments of street approaches and the building of a viaduct.

—Rook. The Pittsburg & West Virginia has awarded a contract for a machine shop to the T. J. Foley Construction Co., Pittsburg, Pa. Estimated cost, $150,000.

—South Philadelphia. The Pennsylvania has awarded a contract for eight inter-track platforms at its perishable products terminal, to cost about $65,000, to Sinclair & Grigg, Philadelphia.

—Uniontown. The Pennsylvania has awarded a contract for a station and express building to W. F. Trumble & Sons, Pitsburgh, to cost $100,000.

TENNESSEE.—Springfield. The St. Louis-San Francisco will use its own forces in building a seven-stall addition to the North side enginehouse and a 60-ft. extension to the West side coach house, to cost about $100,000.

—Yale. The St. Louis-San Francisco has awarded a contract for reinforced concrete foundations for shop buildings, enginehouse, turntable, water tower and cinder pits at the new locomotive terminal, to the United Construction Co., Cincinnati, Ohio, to cost $60,000.

TEXAS.—Amarillo. The Santa Fe is preparing plans for a general office building.

—Edinburg. The Southern Pacific is said to be preparing plans for twelve combined freight and passenger stations on the new lines from Edinburgh to Harlingen, and to Falfurrias, Texas.

—Fort Stockton. The Kansas City, Mexico & Orient has awarded a contract for a passenger station to cost about $30,000 to John S. Cates.

—Fort Worth. The Texas & Pacific will spend approximately $2,500,000 during 1927 on the new freight terminal, yard and shops. A contract for the buildings has been awarded to the Austin Co., Cleveland. The road's own forces will do the track laying.

—Houston. The Missouri-Kansas-Texas Lines have purchased a site for a new freight warehouse at a cost of about half a million dollars. Definite announcement concerning plans will be made soon.

—Isom. The Santa Fe will construct a frame enginehouse with concrete pits. The structure will be 96 ft. by 208 ft.

McAllen. The Southern Pacific has awarded a contract to the Ware Co., El Paso, for a hollow tile and stucco passenger station.

—Odessa. The Texas & Pacific, it is said, is preparing plans for a brick passenger station, to cost about $100,000.

—Slaton. The Santa Fe is figuring on an addition to its enginehouse.

—Wills Point. The Texas & Pacific has awarded a contract to F. A. Mote, Dallas, for a brick freight and passenger station, to cost about $50,000.

UTAH.—Salt Lake City. The Denver & Rio Grande Western has contracted with Roberts & Schaefer Co., Chicago, for a standard "N & W" type electric cinder handling plant.

VERMONT.—Burlington. The Central Vermont has purchased from Roberts & Schaefer Co., Chicago, automatic electric hoisting equipment for an existing coaling station.

VIRGINIA.—Pinners Point. The Atlantic Coast Line has purchased a Junior "N & W" type cinder handling plant from Roberts & Schaefer Co., Chicago.

WASHINGTON.—Seattle. The St. Paul has been authorized by the federal court at Chicago to construct a spur track and warehouse, to cost about $56,000.

WISCONSIN.—Land O'Lakes. The Chicago & North Western will construct a combined freight and passenger station. Contract has been awarded to Anton J. Ebert, Argonne, Wis.

Locomotive Orders

Very few orders for locomotives were placed during the first few weeks in April although there was some improvement in the market due to large inquiries developing, and the announcement by the Erie that it intends to purchase 50 heavy Mikado locomotives and 30 switch engines. Other inquiries were those of the New York Central for 30, 4-6-4; 30 4-6-2 and six heavy eight-wheel switchers; the Boston & Maine, 25 freight, and 10 eight-wheel switchers; the Lackawanna, 15 Mountain type; the American R.R. of Porto Rico, 2 narrow gauge, and Mitsui & Co. for export. The largest orders placed in the early part of the month were those of the Southern Pacific and the Sorocabana Ry., of Brazil, each for ten locomotives placed with the American Locomotive Co.

From January 1 to the date of our going to press the locomotive builders report having received orders for a total of 216 engines. A complete list of these orders follows:

Purchaser	No.	Type	Builder
Apalachicola Nor.	1	4-6-0	Amer.
A. T. & S. F.	10	Santa Fe	Bald.
Bang. & Aroostook	5	Pacific	Amer.
Barber Asphalt	1	Switching (6)	Bald.
Can. Nat'l for Grand Trunk	12	4-8-4	Amer.
	10	Switching	Lima
Central Vermont	4	4-8-2	Amer.
C. & N. W.	12	2-8-4	Amer.
	8	Switching (8)	Amer.
	1	60 Ton Diesel Elec. Switching	Amer.
Chicago, S.S. & S.B.	2	Electric	West.
C. B. & Q.	12	2-10-4	Bald.
Comm. Edison	1	Switching (6)	Lima
D. & R. G. W.	10	Mallet	Amer.
Ferrocar'l de Antioquia Colombia	1	Mikado	Bald.

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SAN FRANCISCO

United Electric Apparatus Co.
BOSTON

Gulf Coast	5	Switching (8)	Amer.
	6	Pacific	Amer.
Huntington & B. T.	2	Consolid'n	Bald.
Inland Steel	1	Switching (6)	Bald.
Internat'l Lumber	1	Switching (8)	Bald.
Internat'l & G. N.	5	Switching (8)	Amer.
Lehigh & Hudson	2	Consolid'n	Bald.
Maine Central	2	Tenders only	Amer.
Mich. L. & Chem.	2	Switching (6)	Lima
Minn. Dakota & W.	1	Switching (8)	Bald.
Missouri Pac.	5	Mountain	Amer.
	15	Switching (8)	Amer.
Mobile & Ohio	5	Switching (6)	Amer.
Monongahela	6	Mikado	Bald.
Mukden & Hailung	4	Mogul	Bald.
New Eng. F. & T. Co.	1	Switching (8)	Amer.
New Orleans G. N.	3	Mountain	Amer.
New York Cen'l	1	Switching	Amer.
N. Y., N. H., & H.	6	3 cyl. switching (8)	Amer.
Oliver Iron M. Co.	10	Switching (8)	Lima
Pickands-Mather	2	Switching (6)	Lima
Sorocabana Ry.	10	4-8-2; 3 cyl.	Amer.
Southern Pac.	10	4-10-2; 3 cyl.	Amer.
Texas & Pac.	15	2-10-4	Lima
Toledo, Peoria & W.	4	Mikado	Amer.
Youngstown & Nort'n.	2	Switching (6)	Amer.

Passenger Car Orders

Our records show that over 800 passenger cars and 100 self propelled cars were ordered in the first three months of this year. Some of the largest orders were as follows: Southern Pacific, 76 cars; Baltimore & Ohio, 80; Wabash, 42; Santa Fe, 30; Long Island, 127; Missouri Pacific, 69; North Western, 120; and the Rock Island, 58. Practically no large orders were placed since that of the Southern Pacific up to the time of our going to press. The New York Central, however, is in the market for a total of 121 cars divided as follows: 22 coaches, 10 suburban coaches, 10 steel motor car bodies, 30 baggage, 10 baggage-horse, 30 milk, 3 combination passenger and baggage, 5 combination mail and baggage, and one steel motor baggage body. The Chicago & Illinois Midland is said to be inquiring for six cars.

Freight Car Orders

Orders for freight cars so far this year seem to be running only slightly ahead of last year which was the leanest year since 1921 when only about 28,000 cars were ordered. Recent large inquiries which have developed, such as the New York Central and Lackawanna point to considerable improvement

Recent small inquiries are as follows: Lehigh & New England, 200 box and repairs for 200 hopper cars; Fruit Growers Express Co., 651 underframes; Rock Island, 100 underframes for refrigerator cars; Cambria & Indiana, repairs for 300 hoppers; and the American Sugar Refining Co., 125 cane cars.

There have been during the year some large orders for special type cars, such as the 500 tank cars recently ordered by the Union Tank Car Co., and the 1,000 general service cars and 200 tanks ordered by the Southern Pacific. Orders for ballast, dump and work cars have been unusually heavy doubtless due to the increasing volume of new track construction, duble tracking, etc. A number of the roads are building and reconstructing a large number of cars in their own shops. The Great Northern are to build 500 box and 100 flat cars and to equip 2,000 more box cars with steel underframes; the Frisco built 600 flat bottom coal cars at Yale during January, February, and March; the Western Maryland will build 1,000 hopper cars, the Burlington, 1,000 gondolas; the Katy 500 cars at the Denison shops, and the Southern Pacific is building 750 cars at Sacramento.

Among the recent orders for cars were the following: Union Tank Car Co., 500 tank cars; Pere Marquette, 1,000 box cars, 250 gondolas and 250 hopper; Southern, 10 air-dump; St. Louis Southwestern, 30 caboose; Pacific Fruit Express, 89 refrigerators and 600 underframes; Denver Rio Grande Western, 300 automobile cars; Guantanamo Sugar Co., 30 box and 2 air dump; and the Soo, 300 gondolas.

Changes in Personnel

Executive & Operating

L. T. Martin has been appointed vice chairman of the Teminskaming & Northern Ontario, with headquarters at Ottawa, Ont.

R. Lee Kempner has been elected president of the Rio Grande Railway, with headquarters at Galveston, Texas.

G. A. Austin has been appointed receiver and general manager of the Gainesville & Northwestern, with headquarters at Gainesville, Ga. **Luther Reynolds** succeeds Mr. Austin as superintendent.

A. T. Mercier, general manager of the San Diego & Arizona, has been elected president and general manager, succeeding John D. Spreckels, deceased.

Roy Terrell has been elected vice president and general manager of the New Orleans & Pontchartrain Bridge Co., with headquarters at New Orleans. His resignation as vice president and secretary of the Gulf Coast Lines took effect April 15.

Lyttleton F. Wilson has been appointed assistant general manager of the Denver & Rio Grande Western, with headquarters at Denver.

Walter E. Teague, office manager for the operating department of the Southern Pacific at San Francisco, has been elected vice president and general manager of the Los Angeles Union Terminal Co., with headquarters at Los Angeles.

H. D. Handley has been promoted to superintendent of the Southern Pacific of Mexico, with headquarters at Empalme, Son.

Ralph F. Ray, general supervisor of wages and working agreements of the Denver & Rio Grande Western, has been appointed assistant general manager. **O. G. Gephart** has been appointed inspector of transportation, with headquarters at Denver.

Michael J. Curry, former assistant to the vice president and traffic manager of the Southern Pacific, has been elected vice president of the Western Pacific, with headquarters at New York.

Dr. H. A. Harris has been appointed chief surgeon of the Southern Pacific of Mexico, with headquarters at Empalme, Son.

T. Joseph Jelbart has been appointed superintendent of passenger transportation of the Pennsylvania, with headquarters at Pittsburgh, Pa.

William L. Hughson of Los Angeles, has been elected to the board of directors of the Western Pacific.

Robert Wilson has been promoted to executive assistant of the Pacific Great Eastern, with headquarters at Vancouver, B. C., the position of general manager having been abolished.

Ira B. Chadwick, assistant superintendent of the Ohio division of the New York Central, has been appointed superintendent of the southern division of the Ohio Central lines.

E. J. Weber has been advanced to assistant to the president of the Maryland & Pennsylvania.

Dr. Philip Stephens has been appointed chief surgeon of the Los Angeles & Salt Lake, with headquarters at Los Angeles, succeeding **Dr. Guy Cochran,** resigned.

T. E. Mitten has been elected chairman of the board of directors of the International Railway Co., and **J. A. Queeney,** chairman of the executive committee. **Dr. A. A. Mitten** has been added to the executive committee and **Harold P. Lesswing** has been elected a director of the company.

Richard K. Bradford has been promoted to superintendent of transportation of the Denver & Rio Grande Western, with headquarters at Denver.

The Burlington has announced the following changes: **M. B. Lamb,** superintendent Creston division, Creston, Ia.; **L. C. McBride,** superintendent Hannibal division, Hannibal, Mo.; **C. J. Connett,** superintendent, Ottumwa, Ia.; **M. C. Hughes,** assistant superintendent, Ottumwa division; **J. L. Mulroy,** assistant superintendent La Crosse division, La Crosse, Wis.

A. Ewing, formerly superintendent of the New Mexico division of the Santa Fe, at Las Vegas, has been appointed assistant general manager in charge of the western district of the eastern lines, succeeding **D. S. Farley** whose jurisdiction has been changed to the eastern district. **J. F. Anton,** superintendent of the Panhandle at Slaton, succeeds Mr. Ewing at Las Vegas. **J. C. Barton,** assistant superintendent of the western lines at Wellington, Kans., succeeds Mr. Anton, and **H. R. McKee** succeeds Mr. Barton.

Announcement has been made of the election and appointment of officers of the Cisco & Northeastern, as follows: **W. H. Williams,** chairman of the board of directors; **J. L. Lancaster,** president; **R. Q. Lee,** vice president; **J. E. Davey,** vice president; **Carl A. deGersdorff,** gen-

eral counsel; **Guy Dabney**, treasurer; **D. D. Walker**, auditor, assistant secretary and general freight and passenger agent; **M. D. Cloyd**, secretary, and **B. C. Crow**, superintendent.

G. M. Richards, Jr., general manager of the Cumberland & Manchester, until its acquirement by the Louisville & Nashville, has been elected general manager of the Frankfort & Cincinnati, with headquarters at Frankfort, Ky., with jurisdiction over all departments, succeeding **J. H. Switzer** who has been appointed superintendent with supervision over transportation, maintenance and mechancial matters.

Nelson T. Brown has been appointed vice-president in charge of transportation.

Financial and Legal

R. P. Eubank has been appointed general real estate agent of the Chesapeake & Ohio and of the Hocking Valley, with headquarters at Richmond, Va. **E. B. Rush** has been appointed assistant general real estate agent with the same headquarters.

R. P. Rockefeller has been appointed assistant treasurer for the receivers of the St. Paul with headquarters at Chicago.

S. B. Goldman, assistant auditor of the Southern Pacific of Mexico, has been promoted to auditor, with headquarters at Tucson, Ariz., and Empalme, Son.

Edward W. Holmes has been appointed assistant treasurer and assistant secretary of the International Railway Co., and the International Bus Corpn.

The headquarters of **G. B. Herbert**, assistant auditor of the Texas & Louisiana lines of the Southern Pacific, and **R. Drushcckke**, assistant auditor of disbursements, have been removed from New Orleans to Houston.

M. F. Harden has been appointed general auditor and treasurer of the Florida East Coast Car Ferry Co. **T. V. Pomar**, assistant treasurer and comptroller has been granted a six months' leave of absence.

Purchases and Stores

J. C. Daniels has been appointed storekeeper of the Richmond car works of the Chesapeake & Ohio.

O. A. Schultz, chief lumber inspector of the Burlington has been appointed inspector of stores, with headquarters at Chicago, succeeding **H. R. Duncan** who has been appointed traveling storekeeper.

W. A. Prueit has been appointed stationery storekeeper of the Chesapeake & Ohio, with headquarters at Richmond, Va., succeeding **W. B. Smethie.**

E. L. Murphy, traveling storekeeper of the Chicago & Alton, has been appointed assistant general storekeeper, with headquarters at Bloomington, Ill., succeeding **H. O. Wolfe**, who becomes general storekeeper at the same point. Mr. Wolfe replaces **F. C. Riley** who has been given a leave of absence owing to ill health.

Traffic

Louis J. Brinkman, general agent of the Michigan Central, with headquarters at Detroit, has been appointed general freight agent with the same headquarters.

Randolph B. Cooke has been promoted to general freight and passenger agent of the Pennsylvania in Norfolk and the Norfolk-Portsmouth district. This position has been created recently owing to the increasing importance of Norfolk as one of the chief terminals of the Pennsylvania System, and as a most important gateway of traffic to and from the southeastern states.

F. C. Jerome, assistant general freight agent of the New York Central Lines, Buffalo and east, has been appointed general freight agent of that road and of the West Shore, with headquarters at New York City. **C. I. Johnson** has been appointed assistant general freight agent of the lines east of Buffalo and of the West Shore, with headquarters at New York City.

Reginald P. Paterson, general freight traffic manager of the Pere Marquette, with headquarters at Detroit, has been promoted to assistant freight traffic manager. **Edwin T. Reynolds** has been promoted to general freight agent, with headquarters at the same point.

Charles E. McCullough, assistant general passenger agent of the Pennsylvania at Washington has been appointed general passenger agent at the same point.

E. L. Happel has been appointed live stock agent for the Northern Pacific with headquarters at St. Paul.

Edwin L. Jennings has been promoted to assistant general freight agent of the Michigan Central, with headquarters at Detroit.

L. M. Thorpe has been appointed special agent in the general freight department of the Long Island Railroad. **E. B. Hoskins** has been appointed assistant general freight agent, with headquarters at New York.

J. E. Wilmot, formerly general manager of the Western New York Motor Lines, has been appointed general traffic solicitor for the I. R. C., and the I. B. Cn., with headquarters at Niagara Falls.

S. T. Surratt, Jr., has been appointed general agent of the Florida East Coast Ry. and the Florida East Coast Ferry Co., at New York City, succeeding **Edward Ottsen** who is transferred to the position of general agent at St. Louis.

F. M. Hicks, traffic manager of the Gulf, Mobile & Northern, has been elected vice president in charge of traffic, with headquarters at Mobile.

A. Brostedt has been appointed Asiatic traffic manager of the Canadian National, with general supervision over traffic interests of this company in the Orient and the Far East. His headquarters will be in Hong Kong.

J. W. Monahan has been appointed general agent of the Burlington at San Francisco.

W. H. Cundey has been appointed assistant to the passenger traffic manager of the Denver & Rio Grande Western, with headquarters at Denver. **H. I. Scofield**, general agent at Detroit, succeeds Mr. Cundey as general passenger agent at Denver, and **F. G. Hogue**, general agent at Kansas City, succeeds Mr. Scofield at Detroit. **H. F. Kleine**, traveling passenger agent replaces Mr. Hogue at Kansas City.

Mechanical

Lawrence Richardson, formerly assistant to the president of the Boston & Maine, has been appointed mechanical superintendent of the road, succeeding **W. O. Foreman** who has joined the staff of Manning, Maxwell & Moore, Inc. Mr. Richardson will have charge of the locomotive and car departments. Other changes in the mechanical department are as follows: **C. B. Smith**, assistant to the mechanical superintendent, has been appointed engineer of tests; **L. C. Winship**, electrical superintendent and supervisor of power plants, has been appointed electrical engineer. **I. C. Blodgett**, assistant to the mechanical superintendent, has been appointed supervisor of schedules.

Henry H. Urbach has been promoted to superintendent of motive power of the Burlington lines west of the Missouri River, with headquarters at Lincoln.

A. K. Galloway, district master mechanic of the Baltimore & Ohio, with headquarters at Baltimore, has been appointed superintendent of motive power of the western lines, with headquarters at Cincinnati, succeeding **W. Malthaner**, who has been granted leave of absence. Other appointments are as follows: **G. R. Galloway**, district master mechanic at Baltimore; **E. J. McSweeney**, district master mechanic at the southwest district; **Harry Rees**, master mechanic at Akron; **H. J. Burkley**, master mechanic at Washington, Ind.; **J. J. Herlihy**, master mechanic at Glenwood, Pa.

J. O. McPake has been appointed master mechanic of the Toledo, Peoria & Western, with headquarters at Peoria, Ill., succeeding **F. R. Eckard.**

Charles W. Quinn has been appointed mechanical engineer of the Boston & Maine, with headquarters at Boston.

Albert E. Jones, general foreman in the mechanical department of the Chicago Great Western at St. Paul, has been promoted to superintendent of shops at Oelwein, Iowa.

H. C. Caswell, general foreman in the mechanical department of the Wabash at the Detroit terminals, has been appointed superintendent of the locomotive shop at Dectaur, Ill.

Civil

Harold Rindal has been appointed chief engineer of the Pacific Great Eastern, with headquarters at Vancouver, B. C.

J. W. Young, formerly assistant engineer for the Richmond Construction Co., Galveston, Tex., has been appointed assistant engineer on the Ft. Worth & Denver City, with headquarters at Ft. Worth.

H. H. Main has been appointed engineer of maintenance of way of the Toledo, Peoria & Western, with headquarters at Peoria.

E. E. McLellan has been appointed chief engineer of the Maryland & Pennsylvania.

R. L. Sims has been promoted to engineer of maintenance lines west of the Missouri River, with headquarters at Lincoln. He succeeds **H. C. Murphy** of the Burlington, who has become transportation assistant on the staff of general manager at Omaha.

R. G. Heck has been promoted to division engineer of the eastern lines of the St. Paul, with headquarters at Savanna, Ill.

S. H. Pulliam has been appointed train master, Chesapeake & Ohio, with jurisdiction over Strathmore yard, Virginia air line and Buckingham subdivisions, with headquarters at Strathmore, Va. **T. H. Greene** has been appointed division engineer, with headquarters at Richmond, Va., succeeding Mr. Pulliam. **J. D. Keiley** succeeds Mr. Greene as division engineer at Clifton Forge; **L. J. Drumeller** becomes assistant division engineer at Russell, Ky., and **J. W. Knapp, Jr.**, assistant division engineer at Richmond.

The present engineering, construction, valuation, maintenance of way and signal departments of the Boston & Maine, have been combined with **William J. Backes** as chief engineer, **Frank C. Shephard**, consulting engineer in charge of major construction work and valuation; **William F. Cummings** as engineer in charge of maintenance of way and signals; **Charles J. Griffin** becomes principal assistant engineer; **Warren Y. Scott**, signal engineer, will have charge of signal design and construction. The offices of electrical engineer, architect and real estate engineer are abolished. **Guy H. Watson**, division engineer of the Portland division, becomes assistant to the engineer maintenance of way, and **Joseph A. Parent**, engineer of standards. **Timothy G. Sughrue**, supervisor of bridges and buildings, Portland division, becomes division engineer of that division.

Obituary

Samuel M. Saltmarsh, 59 years old, car accountant of the Coast Lines of the Santa Fe, died at his home, April 22, of influenza.

Henry L. Des Anges, engineer of floating equipment of the Long Island Railroad, died at his home in Flushing, April 16.

Walter S. Keenan, general passenger agent of the Gulf, Colorado & Santa Fe at Galveston, died on April 2.

John L. Stewart, member of the Pennsylvania state public service commission, died at Harrisburg, April 12, aged 60.

Herbert K. Relf, general claim agent of the Spokane, Portland & Seattle, died at his home at Portland, Ore., April 10.

George H. Crosby, retired assistant to vice president in charge of traffic, C. B. & Q., died March 30, at the Deaconess hospital, St. Louis.

George H. Bremner, formerly a district engineer on valuation for the I. C. C., died April 3, at his home at La Grange, Ill., after an illness of about three years. Mr. Bremner was treasurer of the American Railway Engineering Assn., for 16 years.

Supply Trade Notes

The Parsons Co., of Newton, Iowa, has arranged with Fairmont Railway Motors, Inc., of Fairmont, Minn., to distribute the Parsons rail crane through the Fairmont national sales organization. Wm. S. Miller will continue as manager of the railroad equipment department of the Parsons Co., and cooperate with the Fairmont sales force in distributing Parsons cranes and other machines which are being developed for railroad market.

C. K. Elliott has been appointed assistant to the president in charge of sales of the Standard Brake Shoe & Foundry Co., Pine Bluff, Ark.

The Rivet Cutting Gun Co., has moved to a new location at 125 East Third St., Cincinnati.

The S. K. F. Industries, Inc., have moved their home office to more commodious quarters at 40 East 34th St., New York.

The Southern Wheel Co., has removed its general offices from Pittsburgh, to 3002 Grand Central Terminal, New York.

The Track Specialties Co. New York, has appointed Luis Mendez Armendariz, Avenida 5 de Mayo Num. 10, Apartado Postal 2134, Mexico, D. F., as its representative in Mexico, and Jorge Triana, Apartado No. 5, Bogota, Colombia, as representative in Colombia.

J. G. Carruthers, former sales manager, has been elected vice president of the Otis Steel Co. G. A. Paine has been appointed treasurer succeeding L. Kemper, resigned, and J. W. Carpenter has been appointed assistant secretary-treasurer.

Hill, Hubbell & Co., manufacturers of paints and varnishes, 115 Davis St., San Francisco, has found it necessary, on account of limited space in their factory, to construct an additional one story concrete building containing 5,200 sq. ft., for the manufacture of varnish. It is expected this building will be ready for occupancy by January 15, 1928.

Harry S. Vincent of the Franklin Railway Supply Co., New York, will read a paper on "The Limited Cut-Off Engine" before the May meeting at Buffalo of the Central Railway Club.

At the annual meeting of the Ralston Steel Car Co., April 4, the following officers were elected for the ensuing year: F. E. Symons, president; F. A. Livingston, vice-president and treasurer; L. C. Roy, secretary and asst. treasurer.

Leon P. Feustman, vice president of the Worthington Pump and Machinery Corpn., New York, died at his home April 7, aged 66.

Frederick Weston, of the manufacturing department of the Baldwin Locomotive Works at Philadelphia, died in Wynwood, April 17, aged 49.

George W. Brown, an attorney of Chicago, and formerly vice president and a director of the T. W. Snow Construction Co., died April 20.

The Brown-Bevis Co., Inc., of Los Angeles, announces it has opened a railway supply department. A. V. Swartz is to be in charge.

A. L. Hayes, district manager for the White Co., has been appointed assistant to the vice president of the central region. John Voelker, formerly sales manager, succeeds Mr. Hayes at Cleveland. The Columbus and Toledo branches, formerly part of the Cleveland district, have been created separate districts, with C. S. Carris as district manager at Columbus and Armen F. Ling as district manager at Toledo. Richard T. Fullerton has been appointed branch manager at Erie, Pa. The White Co., has just completed a new building at Milwaukee, has begun the construction of new buildings at New York and at Los Angeles, and has prepared plans for buildings in Syracuse, N. Y., Providence, R. I., and Hartford, Conn.

The Continental Steel Corpn., has organized following the consolidation of the Superior Sheet Steel Co., Canton, Ohio, the Kokomo Steel & Wire Co., Kokomo, Ind., and the Chapman-Price Steel Co., Indianapolis. The following officers have been elected: J. E. Frederick, chairman of the board of directors; Miles Chapman, chairman of the executive committee; Henry A. Roemer, president, and D. A. Williams, vice president in charge of all operations.

John R. Hayward has been appointed southeastern manager of sales to railroads and other transportation interests for the Heywood-Wakefield Co., Wakefield, Mass.

Joshua A. Hatfield has been elected president of the American Bridge Co., with headquarters at New York, succeeding August Ziesing, who has retired. L. A. Paddock, president of the Canadian Bridge Co., and Frank B. Thompson, auditor, have been elected vice presidents.

The Flannery Bolt Co., Pittsburgh, has appointed J. P. Armstrong its representative at San Francisco, and the Equipment Sales Corpn., as sales representatives at St. Louis.

Thomas L. Mount, former manager of the car lighting department of the Electric Storage Battery Co., Philadelphia, has established the firm of the Thomas L. Mount Co., with headquarters at 136 Liberty St., New York, for servicing and selling electrical supplies to the railroads.

A. R. Chalker, chief draftsman of the Locomotive Stoker Co., Pittsburgh, has been appointed mechanical engineer. C. R. Davison succeeds Mr. Chalker, as chief draftsman.

The W. N. Thornburgh Manufacturing Co., Cicero, Ill., has purchased the dust guard business of the Lacey Williams Co.

G. L. Davis, vice president of the Scullin Steel Co., St. Louis, has been elected vice president in charge of sales New York.

Blake C. Hooper has been appointed manager of railroad sales of the Baker-

Raulang Co., Cleveland, manufacturers of electric tractors, trucks, cranes and bus bodies.

Charles Arthur Moore, Jr., has been elected president of Manning, Maxwell & Moore Inc., New York, succeeding John F. Schurch, who has been elected chairman of the board. John D. Nickles has been elected vice president.

Henry M. Robinson, president of the First National Bank of Los Angeles, has been elected a director of the General Electric Co., Schenectady, N. Y.

A. P. Sweeney, formerly assistant secretary of the mechanical division of the A. R. A., has become associated with Batchelder & Co., Chicago.

The Pullman Car & Manufacturing Corpn., has purchased a controlling interest in the Dickson Car Wheel Co., Houston.

The Westinghouse Electric & Mfg. Co. announces the promotion of H. D. James to be consulting control engineer, and E. B. Newill, manager of control engineering department. Mr. James, a native of Baltimore and a graduate of the University of Pennsylvania, has been associated with the Westinghouse Co., since 1904. Mr. Newill, a native of Atlanta, has been with the Westinghouse Co. since 1915. He is a graduate of the Georgia Institute of Technology.

The Air Reduction Co. Inc., advises it has acquired the Interstate Oxygen Co., a West Virginia corporation with oxygen plants at Wheeling, W. Va., Steubenville, and Portsmouth, Ohio, and the Compressed Gas Manufacturing Co., also a West Virginia corporation having an acetylene plant at Huntingdon.

R. L. McLellan, formerly managing director, Compania Westinghouse Electric Internacional, S. A., of Argentine Republic, has been appointed general manager of the Westinghouse Electric International Co., with headquarters in New York.

Charles R. Long, Jr., president of the Charles R. Long Jr. Co., and vice president of the Okadee Co., has been elected president of the Viloco Railway Equipment Co. M. H. Oakes has been elected vice president of the Charles R. Long Jr. Co., the Okadee Co., and the Viloco Railway Equipment Co. G. E. Johnson has been elected secretary of the Okadee Co., and the Viloco Railway Equipment Co. Guilford Turner and Fred G. Zimmerman have resigned from the companies mentioned.

A. K. Brumbaugh, formerly in charge of the experimental and test engineering departments of the Autocar Co., joined the commercial engineering department of the White Motor Co., April 18. Previous to his 12 years' service with the Autocar Co., Mr. Brumbaugh was superintendent of transportation for the Consolidated Gas & Electric Co., of Baltimore, engineer for the Maryland Casualty Co., with the railway engineering division of the Westinghouse Co., and the electrical department of the Baltimore & Ohio. He received the degree of electrical engineer from Lehigh University in 1909, and is a member of the Society of Automotive Engineers.

The Truscon Steel Co., Youngstown, Ohio has purchased a large tract of land on Slauson avenue, Los Angeles and will construct at once a large factory. Upon completion of the building the company will manufacture all of their products for the trade on the Pacific Coast, in Nevada, Utah, New Mexico, Arizona, Mexico and the Hawaiian Islands in Los Angeles.

To Study Mechanical Accounting

Announcement of a separate department for the study and development of mechanical accounting methods suitable for American railroads has been made by the public service division of the Burroughs Adding Machine Co., Detroit. The department will be in charge of A. S. Trew assisted by R. E. Johnson, formerly with the Union Pacific System. The personnel of the railroad department is composed chiefly of men versed in railroad accounting work.

Included in the field force of the division are ten men: W. J. Daller, formerly auditor of revenue of the Boston and Albany, with district headquarters at Philadelphia; J. P. Doughty, formerly of the Pere Marquette, also at Philadelphia; W. C. Curtin, formerly of the U. S. Railroad Administration at New York; E. H. Chamberlain at Boston; R. A. Burgeson, of the Illinois Central, and J. T. Carney and W. F. Dunn, both of the U. S. Railroad Administration at Chicago; G. W. Ruhl at St. Louis; H. B. Lohmeyer at Cleveland, and A. Knaff at Los Angeles. Offices of the field men are in conjunction with the Burroughs offices in the cities named.

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Chestnut at Thirty-Sixth Street

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University of Pennsylvania	Three Blocks
Pennsylvania Railroad Station	Three Blocks
Baltimore & Ohio Railroad Station	Ten Blocks
Philadelphia City Hall	Twenty Blocks
Walnut Street Bus Line	One Block
Chestnut Street Trolley Service	At the Door
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SPECIAL LUNCHEON—75c
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Recent tests, conducted by Mr. L. H. Kessler at the University of Wisconsin Hydraulic Laboratory, show remarkable improvement in decreased loss of head, and that valve will make rapid closures while handling water at high velocities.

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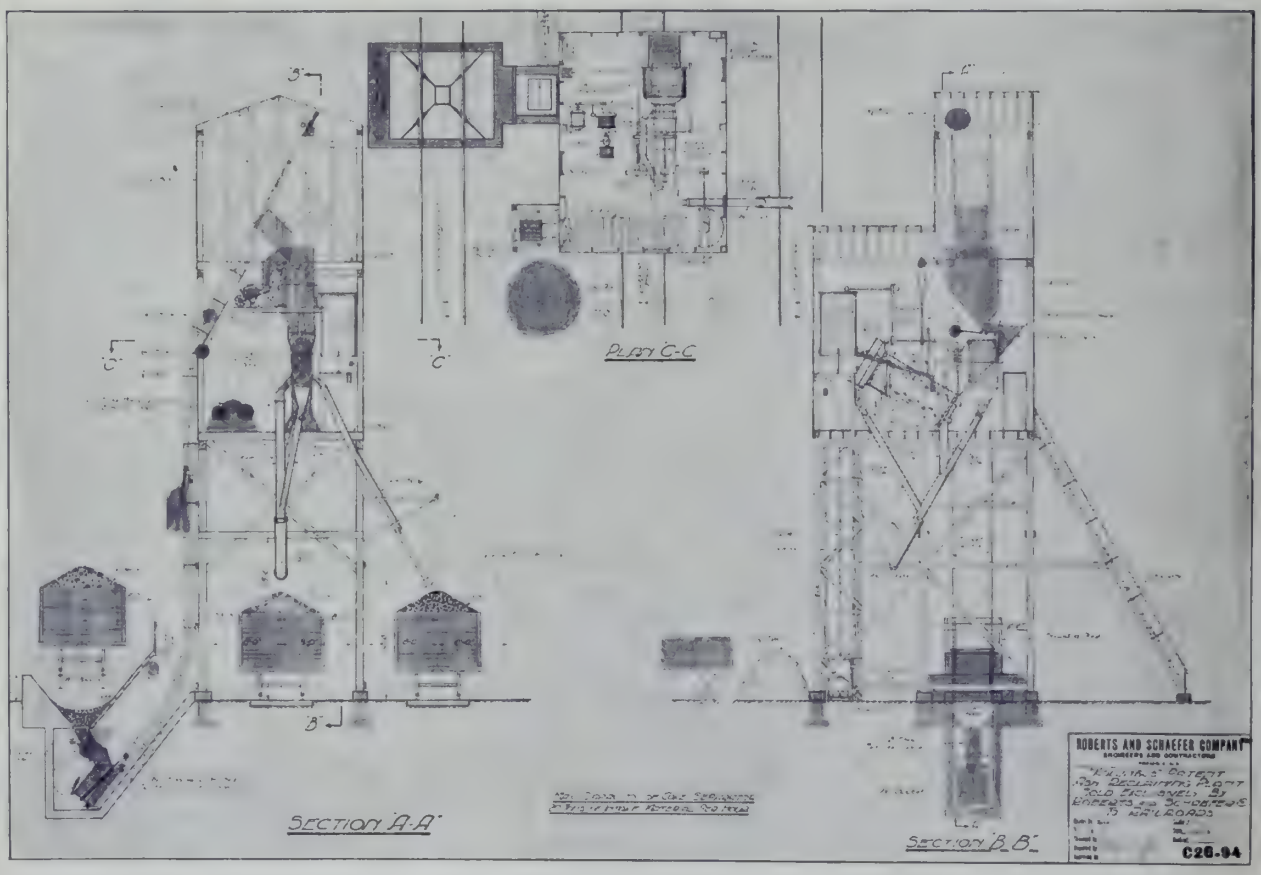

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CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industries

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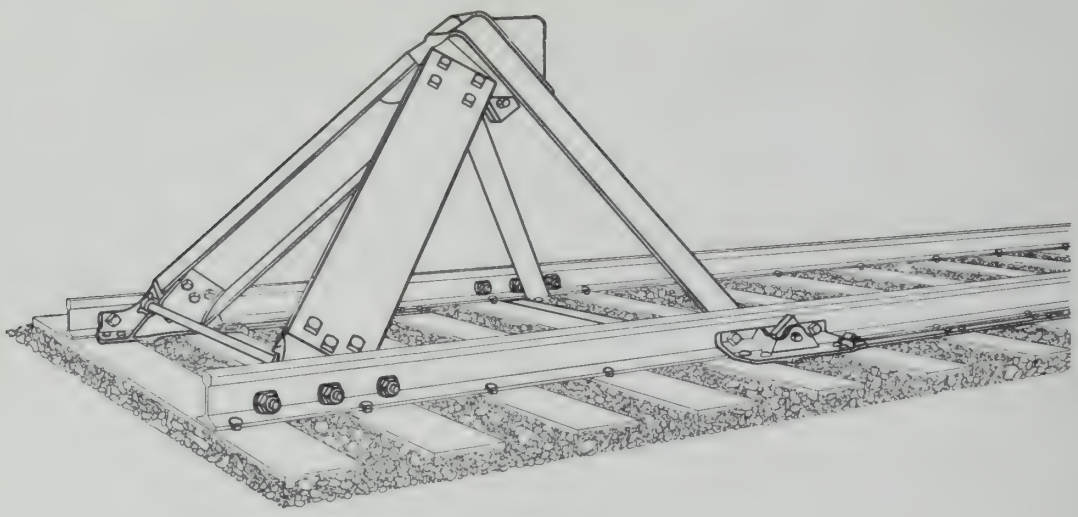
VOL. 1 JUNE, 1927 No. 2

Costs less to install



The Hayes Type W Bumping Post is designed with the particular object of easy and economical installation. This labor cost for putting in track has in numerous cases been less than $8.00.

The reasons for this low cost are apparent to anyone who will examine the post. Skilled labor is not required; a man who can read the even inches on a two-foot rule and the simple directions can erect the post.

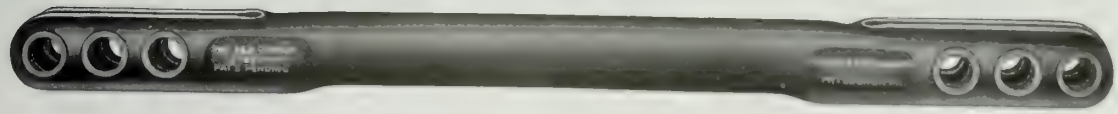
The parts are all highest quality rolled or cast steel and malleable; no cast iron is used. These materials give greater strength with lighter sections and there is no piece requiring more than two men to handle easily.

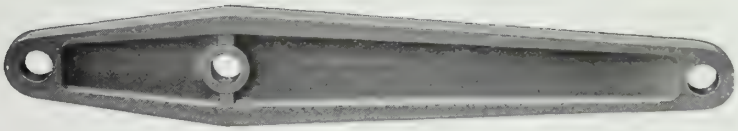
The method of making the post a fixed part of the track renders the use of 12 one-inch bolts in the track rails ample; no bolt takes bending stress or is in other than simple shear; compare this with 16 to 18 bolts 1⅛″ in diameter required in other posts. Drilling the holes in the track rails for Type W is done with an ordinary track drill such as is available on every section.

Type W is erected one piece at a time; it is not necessary to partially assemble the post before installing it.

Every Type W Post is completely assembled in the factory before it is passed for shipment; every part is tested with standard templets and must fit perfectly. Clear directions for installing are sent, not merely with each post, but firmly attached to each bundle. Every precaution is taken to see that the post reaches the consignee in first class condition; it is completely painted; threads are greased and protected from damage by wooden collars.

Type W gives efficient and low cost car stopping service. When knocked out it is not destroyed but may be installed again at a minor fraction of its first cost.





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Correct design, uniform workmanship and proper material spell CAR LIFE.

Wipe aside troubles—Specify Schaefer.

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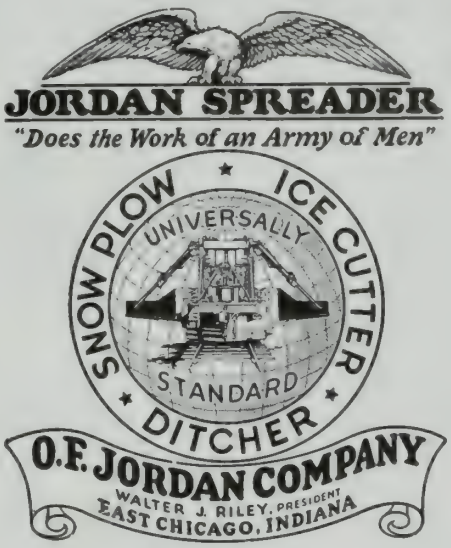

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The load and moving parts of the car are balanced throughout dumping operation

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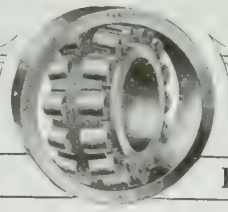
SKF Journal Bearings are basically better than plain bearings



Journal Bearings

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FOR twenty-five years and more railroads have dallied with anti-friction bearings for car journals.

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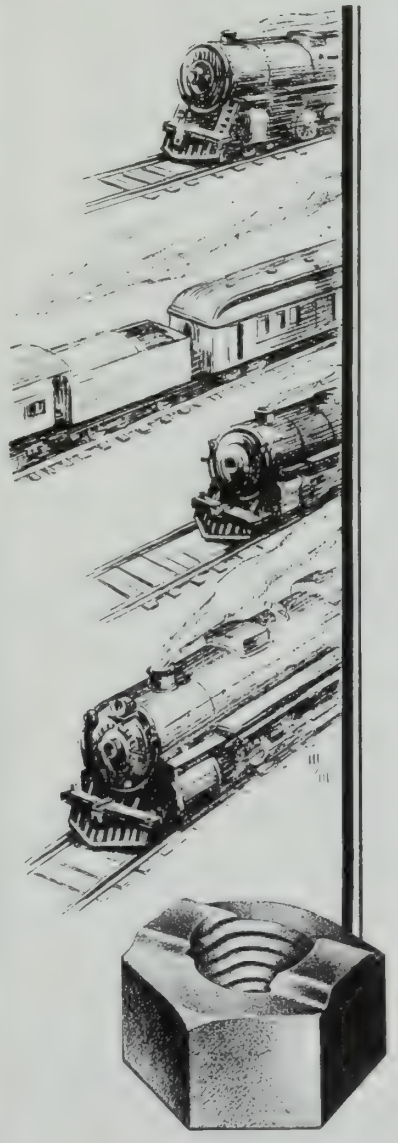

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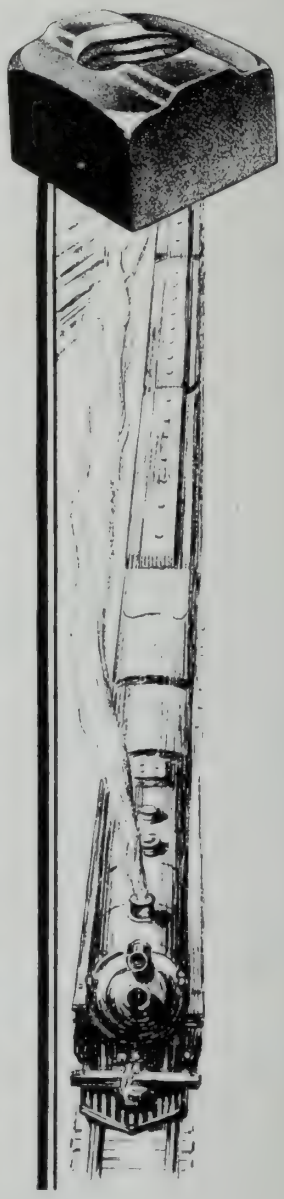

Grip Nuts

Transportation

The Monthly Magazine of the Transportation Industries

JUNE, 1927

VOLUME ONE NUMBER TWO

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Meetings in June

ONE OF the most interesting meetings in June will be that of the American Association of Railroad Superintendents. This is to be held in San Francisco, June 21-24, with a rather elaborate and certainly an interesting program.

In the same week the Protective Section, including the former activities of the American Railway Chief Special Agents and Chiefs of Police Association, will be in session in San Francisco. This association meets June 21 and closes its deliberations June 23.

Montreal is to have the first important railroad gathering of the month. Division V, Mechanical, A. R. A., is to have its yearly meeting in that city June 7-10, at the Hotel Windsor. There will be no exhibits this year.

The Railway Accounting Officers' Association will have its meeting of the year June 7-10, at the Hotel Cosmopolitan, Denver.

The American Railway Development Association will meet June 8-10, at the Hotel Statler, Detroit. This association includes in its membership the industrial and development agents of the principal railroads.

Division VII, Freight Claims, A. R. A., will meet in annual session at Quebec, June 14-17.

The American Association of General Baggage Agents will meet June 21 and close its session June 23, at Mackinac Island, Michigan.

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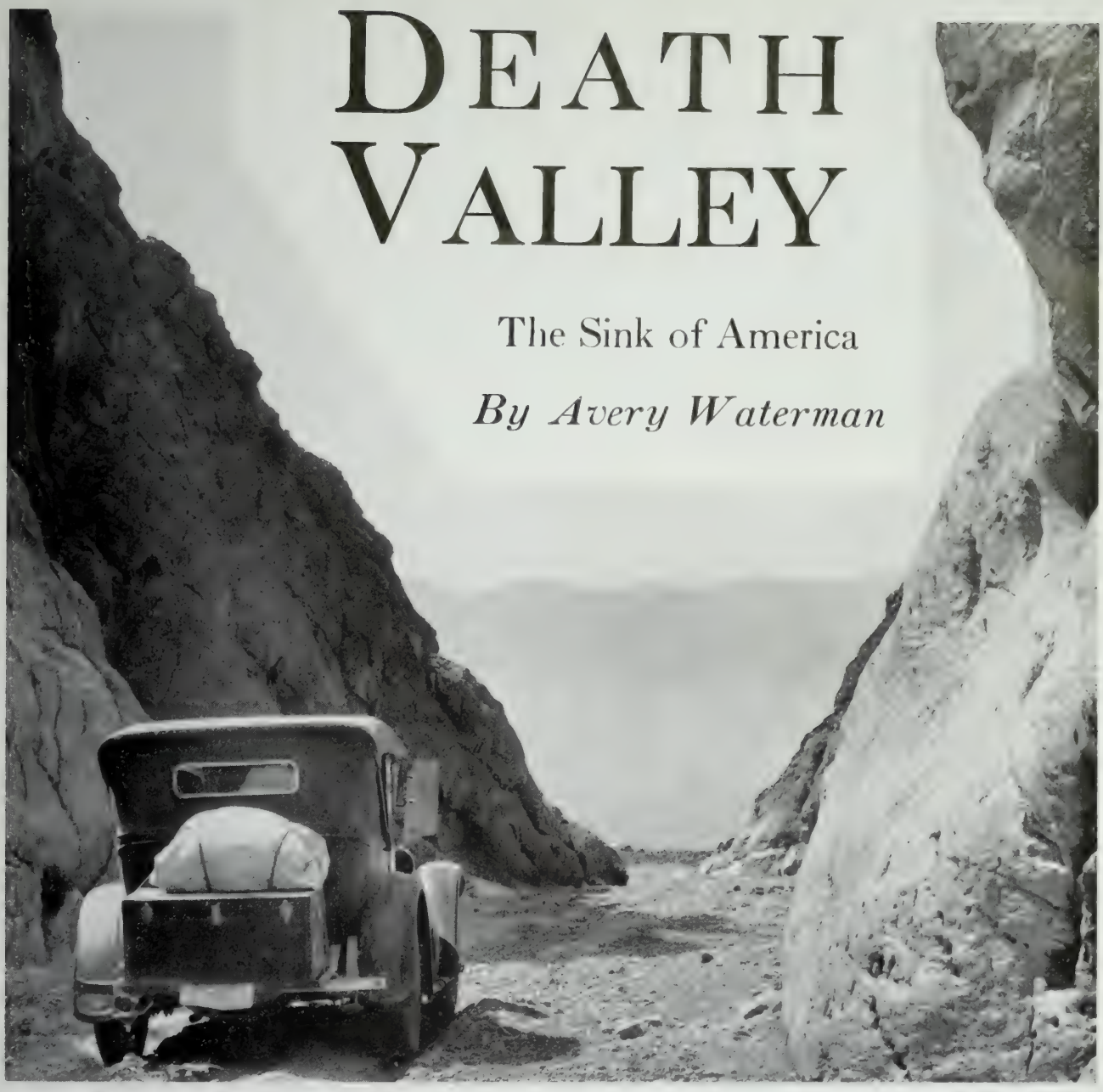
DEATH VALLEY

The Sink of America

By Avery Waterman



THE unending quest for the unusual leads men into strange places. As far back as history goes they have been sailing uncharted seas, scaling the heights, crossing the desert places, seeking the earth's poles; north and south, east and west, they have journeyed over the world, straining their eyes toward the distant rim, to see a little farther into the country beyond. That this trait is peculiar to no one class must have occurred to the psychologists employed in the Union Pacific's passenger department now stirring the country's interest in the weird and fascinating possibilities of Death Valley as an autumn-springtime jaunt for travelers intent upon seeing what doubtless is America's sole remaining wonderland not yet invaded by globe-trotters.

There is much truth, after all, in the old aphorism about familiarity breeding contempt. Men whose lives have been spent in or near the region would be the last persons on earth to suspect that any sane human being would go deliberately into Death Valley. Old timers know too well the tragic story of death in that sinkhole of America. The facts were terrible enough but added to tradition and fancy they made a tale few men could hear unmoved. The weather-beaten headboards on many a grave told the pathetic victory of thirst and starvation over faith and hope. For the pioneer, Death Valley held no attraction forever after if, happily, he escaped alive.

But Death Valley has been conquered, at least for a part of the year, and in keeping with the old record for which the nation owes them a very great deal, the battle was waged by railroad men, and their's is the victory and the gain.

You can go into the valley now in comfort, see its dreadful wastes of sand and salt in upholstered motor cars, rest in a modern hotel at night with all the conveniences and even luxuries that money can buy for such a journey, among the unbelievable privileges being a bath. Imagine!

But choose the season with great care. In the summer Death Valley is one of the most forbidding places on earth. Nowhere else in the world does the temperature go so high at that time of year. It is a torrid, almost lifeless region of barren, burnt sand desert and treacherous salt marshes, a place of sand storms and sand "augers," mirages, bitter and sweet springs, of mystery, adventure, tragedy. This sullen sink, lowest dry land in the Western Hemisphere, is rimmed by gaunt volcanic mountains, twisted and scorched, with Mt. Whitney, highest peak in the United States, overlooking it in the distant west. Excepting perhaps the Polar regions, no place on the globe is so noted for discomforts and peril.

From October to the middle of May this place of summer awesomeness and occasional tragedy has one of the most delightful, most wholesome climates known. The mean maximum temperatures range between 65 and 80 degrees, cooling distinctly after sunset until a small wood fire is desirable. Rain is extremely rare; the total precipitation at Furnace Creek Ranch for 1925 was less than half an inch. A storm is more rare. There are no insects.

A comfortable and attractive inn has been erected on Furnace Creek in Death Valley. It has electric lights, bath and fireplace in every room, a swimming pool in the vicinity, a handsome dining room and lobby, and it is surrounded by a spacious verandah. In short, it is a thoroughly modern hotel in a most unusual and alluring place. Furnace Creek Inn is but 15 miles by highway from Ryan, Calif., terminus of the narrow-gauge Death Valley R. R. The Union Pacific's season for Death Valley Service begins February 1.

Commodious, easy-riding, eleven-passenger Union Pacific motor-buses of the same design as those used in Zion National Park and Bryce Canyon in southern Utah, and run by experienced drivers, connect with the Death Valley R. R. at Ryan for Furnace Creek Inn. The same buses make tours to the crest of the Funeral Mountains and along the floor of Death Valley over safe roads.

Death Valley is about 150 miles long and 10 to 35 miles wide. It is a little more than 300 miles by rail northeast of Los Angeles, 200 miles east of the Pacific Ocean, and is from 100 to 300 feet below sea level. No flood ever will break through the levee that surrounds its bleak and blistering miles. On the east it is walled in by the gayly painted Funeral Range and the many-hued Grape Vine Mountains; the Avawatz Mountains stretch across the southern end; on the west the towering Panamints rise from the scorched floor of the valley, more than 300 feet below sea-level to 11,045 feet, the crest of snowy Telescope Peak; farther north the Cottonwood and the Last Chance Mountains curve in to join the Grape Vine Mountains in closing the valley's northern end. Westward, five extremely arid valleys and four parallel mountain ranges lie between Death Valley and the Pacific Ocean, among them the High Sierra, where Mt. Whitney's white head may be seen, 14,501 feet above the rest of the country. To the south are the Mojave and Colorado deserts; to the east and north is the great Amargosa desert; farther north stretch other desert valleys of Nevada and California. The enclosing mountains, concealing rich deposits of gold, silver, copper, iron, onyx, travertine and marble, are chiefly volcanic—burnt, twisted, tilted, rugged, precipitous and savage, yet they display colors and forms of amazing variety and beauty. Pinks, reds, mauves, lilac, purples, yellows, orange, buffs, tans, greens, grays, black are blended and contrasted in enchanting patterns and combinations, now soft and delicate, now bold and vivid. Toward the northern end of the Panamint

A Waste of Sand Dunes Shifted by the Winds of Centuries. Inset, a Grave in the Desert.

Hope Springs Eternal in the Prospector's Heart As He Searches for Hidden Gold.

Range is Ubehebe Peak, a huge volcanic crater.

Death Valley is not devoid of vegetation as might be supposed, though its growths are sparse and their struggle for survival bitter and incessant; the creosote-bush, the kindred greasewood, several varieties of stunted gray and black sage, salt grass, alkali ink weed, desert holly, several varieties of cacti, including the cholla, palo verde, "sunfish" and "fish hook." In the washes and canyons are other plants — Indian arrowweed, bitter gourds, goldenrod, desert asters, willows, tamerisk and screw-bean mesquite, while higher up the mountains are pinon, pine, mahogany and juniper. Death Valley plants are notable for far-reaching root systems, smallness or absence of leaves so that evaporation surface is reduced, prevalence of vicious spines and thorns, varnish covering stalk and leaf to conserve moisture and make them distasteful to animals. They are hard and savage growths. There are areas where the creosote-bush makes the desert yellowish-green; where the mesquite dots it with green hummocks; where the desert holly spatters it with silver gray.

The history of Death Valley begins in 1850, so far as present requirements are concerned, when it received its name from the first recorded tragedy, although much of the detail of this and other gruesome incidents in the sullen sink are more tradition than history. Some of the graves in Death Valley bear only the significant lines: "He ran out of water."

The first tragedy, however, is history. In 1850 a party of emigrants, California-bound, left the main-traveled trail at Salt Lake City, striking for Cajon Pass through the San Bernardino Mountains (now used by the Union Pacific System). Seeking a still shorter route, they turned, probably in the vicinity of what is now Pioche, through the Pahranagat Mountains and reached Ash Meadows on the Amargosa Desert east of the Funeral Range. Westward from that oasis their difficulties increased with appalling rapidity and the record thereof was written by abandoned equipment to lighten the wagon loads. When they had toiled to the jagged summit of the Funeral Mountains, they looked down extremely precipitous scarps into a deep and deceptive desert upon whose scorched and palpitating floor the winding salt marsh gleamed in the burning sunlight like a cool river. Somehow, with ropes and chains, cattle and wagons were gotten down and the exhausted emigrants passed a sleepless, waterless night. Next day began the terrifying trek across Death Valley. When the full fury of the sun heated the sandy furnace and the treacherous salt marshes, possibly to 140 degrees, the trek became a panic; wagons and cattle abandoned, groups spread out along the base of the Panamints, seeking with despairing frenzy water or egress from the inferno. Of thirty emigrants, perhaps a dozen got through the gap now called Emigrant Wash, found sweet water and survived.

A Tragedy of Thirty Years Ago.

There is a story to the effect that some Piute Indians from the the mountains

Abandoned Railway Station At the Ghost City of Rhyolite.

watched several of the party struggle and die 300 yards from a water hole. Among the survivors was a man named Bennett, who, as he stumbled to a spring, found a ledge of pure silver. He broke off a piece and, when he reached civilization, had it made into a rifle sight.

Thus arose the legend of the Gunsight Lead, which lured many prospectors into Death Valley. In 1860 came Dr. S. G. George, who found and buried several skeletons of the first emigrant party, but these graves have been obliterated by the shifting sand. In the same year another prospecting party under Dr. Darwin French found wagons, guns, cooking utensils, children's toys, lying where they had been abandoned ten years before.

During and after the Civil War, Death Valley was unvisited, except by Piutes and renegade whites, until about 1870, when the hunt for Gunsight was resumed. A camp sprang up in the Panamints in 1873 and brought a rush of prospectors. "Cub" (Leander) Lee, a squaw man, held cattle on Furnace Creek for a year, and "Bellerin" Teck, a bad man, took water from Furnace Creek and raised alfalfa, barley and quails near where Furnace Creek Ranch now stands, thus becoming Death Valley's first resident.

In 1880 borates were discovered in Death Valley, and a new era of scientific exploration, mining and development began. But the tale of tragedies continues, because men ignorant of the desert, deceived by its distances, unprepared for or unequal to emergencies, attempt to traverse it in summer. And picturesque desert personalities are still to be encountered. Lost mines of fabulous richness are still awaiting rediscovery, and the Breyfogle butte of gold is just over the range—somewhere—if one cares to credit the desert prospector, trying to entice the "tenderfoot" into grubstaking him, as many an unwary one does. A number of graves may still be seen, close to the roads traversed by the Death Valley Tour. Death Valley still has its mystery and its thrills.

In 1871 and 1872 large borate marshes were discovered in California and Nevada just north of Death Valley; and in 1880 an old desert prospector, Aaron Winters, with his wife, Rosie, discovered the mineral in the upper end of Death Valley. The ruined Harmony

Ruins of Rhyolite Where 10,000 Population Lived Awhile and Disappeared.

Borax Works on the floor of Death Valley north of Furnace Creek Ranch, the pioneer borax plant, is visited by the motor tour.

The Death Valley borate deposits were gradually acquired by the Pacific Coast Borax Company, whose works are to be seen at the model industrial community, Death Valley Junction, and one of whose picturesque mines is at Ryan, where the motor buses connect. Originally borates were taken from the bottoms of salt

—Copyright, S. H. Willard.

Death Valley, America's Newest Travel Resort, From Dante's View. The Ground At the Bottom is 308 Feet Below Sea Level.

Bungalettes, They're Called, at Stovepipe Wells, Where the Tourists in Death Valley May Rest in Comfort.

marshes, such as those on the floor of Death Valley, in the form of crystals mixed with mud and other salts or as white balls—"cotton balls." Most of the Death Valley deposits are borates of lime in several combinations known as ulexite, colemanite and boydite.

At first the borates were taken from the floor of Death Valley by the Pacific Coast Borax Company and hauled across the desert, where springs were 60 miles apart, to the railroad, nearly 200 miles away, in the famous "20 Mule Teams," still the trademark of the company, although teams have been replaced by the Tonopah and Tidewater Railroad, over which the Death Valley Tour sleeping car is operated between Crucero and Death Valley Junction. Two of the huge borax wagons may be seen at Furnace Creek Ranch.

These wagons, "the largest, most capacious and most economical ever built," were drawn in pairs by twenty mules, stretched out 120 feet from the driver, who handled them all with a single jerk-line and copious profanity. The largest wagons were 16 feet long, 4 feet wide, 6 feet deep, weighed 7,800 pounds, carried more than 20,000 pounds of borates, and cost $900. The hind wheel was 7 feet in diameter, its tire 8 inches wide and an inch thick; the forward wheel was 5 feet in diameter. The wagons at Furnace Creek Ranch are slightly smaller.

At present borates are mined in Death Valley and vicinity much as coal is mined—by shafts, tunnels and stopes driven into the enormous deposits within the mountains. The clean white borates, often of a beautiful crystalline structure, are carried from underground mines by the Baby Gauge railroad, across canyons, through tunnels to chutes at Ryan, whence they move again by rail to the works at Death Valley Junction.

One is scarcely prepared to see a beautiful and well cultivated ranch in Death Valley. The first stop for tourists on one of the motor tours from the Union Pacific trains, after leaving the comfortable hotel, is at Furnace Creek Ranch, 1½ miles away. Eighty acres have been farmed there since the early eighties of the last century by the Pacific Coast Borax Co. It is undoubtedly the strangest ranch on earth, a veritable "Garden of Allah" in the sinister, sun-blasted sink of Death Valley. It is 178 feet below sea-level, with recorded summer temperatures of 137 degrees in the shade, 160 degrees in the sun. The water is obtained from Travertine Warm and Texas Springs. Alfalfa, Kaffir wheat, oats, oranges, and many vegetables are grown there successfully, and a herd of Hereford cows, as well as horses, mules and burros, are kept. A Mexican foreman is in charge, and his laborers are Panamint Indians. Most interesting, however, are the young Deglet Noor date palms, of which there are 126, some of them placed by the United States government in hopes of obtaining pest-free nursery stock. About the ranch house stand tall Washington filifera palms, the native California species, and a number of shorter Phoenix Canariensis palms, natives of the Canary Islands and numerous others.

The Oasis. A Grove of Date Palms on the Floor of Death Valley at the Famous Furnace Creek Ranch 178 Feet Below Sea Level.

"There Goes Another Cow"

A Famous Run of 1860

By C. P. Philbrick

Train Rules Examiner, C. B. & Q. Retired

THE article in Transportation for May on speed brings up interesting contrasts of long years ago. The New York Herald of March 26, 1860, announced under a display heading of "To San Francisco in Eight Days," that beginning April 3, the first rider for the Pony Express would leave St. Joseph, Mo., at 5 o'clock in the afternoon carrying the first consignment of letter mail, that thereafter the service would continue weekly, and that the mail would be speeded through between St. Joseph and Sacramento in at least eight days.

After the service began, as a boy I saw the riders change horses at the first relay station west of St. Joseph, "off again, on again, gone again" almost as quickly as it takes to tell it. Charley Cliff, Johnny Frey, Jim Keitley or Alex Carlyle, leaping from a panting horse, saddle with its pouches fastened, locked and sealed, quickly uncinched and thrown on the waiting horse; a jerk of the cinch, and away they went into the gathering night, perhaps a whoop or two and the rhythmic pounding of the hoofs dying away in the distance. On to Seneca, changing mounts several times enroute. There the rider stopped, and perhaps Mel Baughn took the saddle. And so, on the pouches went, to Rock Creek, Guittards, Kearney, Laramie, Bridger, Theodore Rand, Bill Streeper, Billy Cody, Bob Haslam, "Whipsaw," "Little Yank" and others, taking their turns until, perhaps, Harry Roff would clatter into Sacramento with the pouches that had been transported 2,000 miles over prairies and mountains, across swollen streams, through gloomy canyons by fearless riders whose ambition was never to lose a pouch while they lived.

So, without detracting from their records, I am going to speak of the first rider who carried the mail 206 miles on one horse in a trifle over four hours without dismounting. But this one rode an "Iron Horse" over the Hannibal & St. Joseph R. R., now part of the Hannibal division of the Burlington. His name was Addison Clark, my first boss in the railway service. The Hannibal had reached St. Joseph, February 13, 1859, and was the end of track of western railway construction in the United States. Consequently it was the logical terminus of the Pony Express.

Early in March, the road began to prepare for the first mail trip. Ad Clark was selected as being the man who could make the trip in not to exceed five hours. Today we smile and say, "Oh, that was no great speed," but wait a moment. From Chillicothe to St. Joseph, about 100 miles, the track was practically unsurfaced, much of it with no center filling, cribbed up over many depressions that later were provided with culverts and bent bridges, track over which an engine of modern construction could scarcely crawl. But Ad knew he must approximate 40 miles an hour over it, and was certain that he and his old girl the Missouri, constituted the couple that could do it. He had served his time at the machinist trade in the Lowell shops, and had become a runner. He knew every bolt and rivet in his engine and was a skillful, fearless driver. He took the Missouri,—a Mason engine, 15x22 in. cylinders, weight 29 tons, into the shop at Hannibal and personally overhauled her, carefully adjusting keys and wedges, and repacking truck boxes with a view to prevent wastegrab and consequent heating. When the engine came across the turntable it was in as perfect shape as one could possibly be, and in addition, was ornamented with blazonry of polished brass, goldleaf and varnish. The train to be handled consisted of a mail car, built expressly for the new service, and one coach. The live weight to be carried would be Ad Clark, two firemen, a conductor and brakeman, two mail clerks, and finally, Colonel Haywood, general superintendent, and George H. Davis, roadmaster.

Like all her companion engines, the Missouri was a wood-burner, and the assigned firemen knew their future peace and happiness depended upon their ability to pass and hurl the timber into the firebox, with sufficient rapidity and skill to keep her hot. The fuel agent, L. S. Colman, had arranged at all woodyards where it was likely that the Missouri would have to wood-up, for gangs of men to be ready, each man with a shoulder load of wood, to run across the tender on a gang plank, drop his load, and jump off. Men were assigned also at water tanks to pull down the spouts quickly should the old lady stop to take a drink. At specified times on different parts of the road all trains were to take siding and remain in the clear until after the passage of the Missouri. All outlying switches were to be spiked closed. In short, almost every employe was to do some stunt to promote the movement of the fast mail.

Promptly at 2:00 p. m., April 3,

1860, the Missouri left Hannibal with a train order reading:

"Run wild Hannibal to St. Joseph regardless of all trains."

To Ad this meant regardless of everything on the face of the earth. And so they went, humming out over Bear Creek, flashing across the level prairies of Monroe and Shelby counties. The "O.S" reports from operators at Palmyra, Ely, Monroe, Hunnewell, Shelbina and Clarence came in rapid succession, and Harry Flanders, the dispatcher, busy making his entries on the train sheet, shouted: "My Gawd! Sixty-five miles an hour!"

At Macon, 70 miles from Hannibal, the first wood-up took place which, thanks to the pre-arranged acrobatic stunt of the woodyard force, consumed 15 seconds. Leaving Macon, the heavy grade began and speed was slower, but lost time was recovered on the down hill side, 83 feet to the mile. Ad used to tell me that he didn't shut off; just hooked her up and let her go. The train sheet record indicates that at least 70 miles an hour resulted. On across the Chariton River like a cyclone, and they were up against New Cambria hill, but the old lady went over the top at fairly good speed, and then followed another grand wallop down hill.

Meanwhile, Colonel Haywood and George Davis, with the conductor, were enjoying the hilarity back in the old coach, hanging to seat arms, part of the time one of them in the wood-box or tangled up with the stove, and the other two trying to render first aid until they, in turn would be thrown over a seat back and knocked silly. Occasionally, during periods of semi-consciousness, when they could see out of the rear door through an almost impenetrable cloud of dust and cinders, one would point upward and exclaim: "There goes another cow."

George Davis used to tell me it simply rained hogs all the time. The engine would hit them, knock them in the air and pass them before they struck the ground. George was always noted for his staunch veracity. There was no fenced right of way and no herd law in those days. Had a prehistoric dinosaur rehabilitated itself and opposed the Missouri, Ad would have dropped her down a notch or two and gone after it in the same insouciant manner with which he would have treated a slab-sided hog. He had equipped the old lady with a bull-nose pilot, was authorized to run regardless, and that was that.

The men back in the coach, half strangled by pungent wood smoke, burned by vagabond cinders, continued to hang on. They wept, and probably prayed, hoping to live until Ad Clark should hurl them into St. Joseph. In that town, reports were being received of the time the Missouri was making. Betting on the final result was active. At last wagers were offered that the train never would arrive if Ad tried to maintain his speed over the rough track of the west end, but would surely go in the ditch. Nevertheless, in spite of unsurfaced track, bad alignment, cribbed up openings; over low joints and high centers, where Ad said "We just jumped over the low spots and hit the high ones," the Missouri crashed down from Cameron to St. Joseph a few minutes after 6:00 p. m.

As bands played and crowds cheered and yelled, Ad dropped down on the right hand side, walked around his engine, felt her over, pulled his long yellow beard, and laughingly exclaimed: "Ha ha, old girl! Cool as a cucumber!"

Within a few moments after, the first installment of mail, pressed into the smallest possible space in four saddle pockets, was locked and sealed to the saddle of a waiting horse and little Alex Carlyle, booted and spurred, mounted and galloped to a waiting ferry-boat, hurried across the Missouri River, and the first pony ride westward began. Almost simultaneously Harry Roff started from Sacramento eastward, and the Pony Express was functioning.

Greater speed over billiard-table track, than the ride of Addison Clark has since been made, but considering the physical characteristics of the Hannibal & St. Joseph at that time, this ride has never been excelled, and rarely equalled.

The old Missouri went to the scrap heap long ago; Addison Clark fulfilled his earthly schedule and reached the grand terminal several years ago, and George H. Davis since passed away at his home in Quincy, Ill. shortly after our last meeting in St. Joseph, when for the last time he gave me the story of the ride as we sat in front of the monument in Patee Park, marking the spot where the first pony started, April 3, 1860.

All the world is a camera. Look pleasant, please.

A temper is a fine thing to have. It denotes strength of character. But it is too valuable to lose. Keep it.

The man who has ceased to be pretty much of a boy hasn't made so very much of a success in life.

Transportation gives value to land which no other agency can supply; it is second to land in sustaining human life, but first in advancing civilization.

If you cannot approve the actions of some friend do not criticize him before others; go to him and tell him.

Portable telephones are used extensively nowadays on motor cars by section men, bridge and building gangs and others and have been responsible for improving their efficiency. Very appreciable economies are effected by the use of the telephone at unattended block offices from which train crews may report directly to the dispatchers.

Traveling Air-Brake School

Training In Operation

By Taylor Caven

IF YOU are much of a traveler you have been annoyed, on some railroads, while eating dinner in the diner, to have a plate of soup or a glass of milk slip into your lap when the train stopped suddenly. Such things have happened. Careful as he tries to be, once in a while a waiter will fall against your chair with a loaded tray, and only the most perfectly balanced passenger can keep his temper. It is to make such accidents impossible that many, indeed most railroads, have schools of instruction for engineers and other train men teaching them how to handle air brakes. At great expense these schools are maintained, and sometimes, as in the case of the Union Pacific, special cars are equipped for this instruction work. Such an instruction car is described by J. F. Long, superintendent of motive power and machinery of that road, at Los Angeles, in a recent issue of the company magazine.

This Air-Brake Instruction Car Built by the Union Pacific at Los Angeles Contains Air Equipment Equal to a 75-Car Freight Train and a Six-Car Passenger Train

The car was built in the Los Angeles shops of the Union Pacific. An old 78-foot observation car was used. The body was strengthened by the addition of four truss rods, and six-wheel steel trucks with 5 by 9 journals, and special springs placed under the car to carry the increased weight. The car weighs complete 175,360 pounds.

In the car have been installed 75 sets of freight brake equipment with 43 feet of 1¼ inch and 6 feet of 1 inch brake pipe per set—the equivalent of a 75-car train. Of the 75 sets, sixty are 10 inch and fifteen are 8 inch equipments. Standard "K" Triple Valves were used on all but eight equipments where old style quick action valves were employed to approximate average freight train conditions, and at the same time to better demonstrate the advantages of the "K" Valve.

In addition, there were installed six sets of passenger equipment, two single PM, two single LN, one double cylinder UC and one single cylinder UC of the quick service type. This, with the piping and other accessories, is equivalent to a 6-car passenger train.

One operative automatic slack adjuster was installed and all reservoirs and other demonstrative apparatus is inside the car.

Brake pipes separate from that used with the freight equipment were installed, 63 feet of 1¼ inch and about 14 feet of 1 inch pipe being used per set.

A fourteen passenger car signal line equipment is represented by fourteen 63 foot lengths of ¾ inch pipe with cutout cocks and hose; also several car discharge valves. There is a seating space for fifty persons.

Across the end of the car a complete set of locomotive air brake operating details, including two driver and one tender brake cylinders, have been installed in such a manner as to be in full view of the class. Either passenger or freight equipment may be operated from the one locomotive equipment by opening one cutout cock and closing another.

Besides the regular locomotive air gauges, two single pointer gauges with 12 inch dials have been used, one showing brake pressure at head end and the other at rear of train, or on the seventy-fifth car. This is calculated to bring out more forcibly than words, the time interval as between the head and rear positions of the train, especially during the release operation.

The car was equipped completely in the car shop at Los Angeles by W. A. Johnson, general car foreman, under the personal supervision of Foreman R. B. White. The air brake details and piping were engineered by V. Villette of the Westinghouse Air Brake Company, and the finishing touches were added by J. R. MacDonald, general air brake instructor, Union Pacific System.

Classes in the car were started at Los Angeles late in the summer. It is intended to have as many road engineers and firemen as possible examined in the car in the handling of air, as rapidly as they can take the examinations.

Luncheon Is Served in the Dining Car

By

C. W. Walbraith

A Union Pacific Steward and Crew Getting Supplies in the Commissary at Ogden.

THIRTEEN million meals were served the traveling public last year by Fred Harvey for the Santa Fe System in dining cars, lunch rooms and hotels. Even one million of anything is beyond the comprehension of ordinary mortals, particularly a million meals, so that thirteen times that number presents a rather hopeless picture.

But there is a way to figure it out somewhat understandingly. The versatile James B. Duffy, general passenger agent for the Santa Fe, says that to feed thirteen million persons it took a train load of eggs, that is to say 52 carloads, or 20,800 cases, 624,000 dozen. Milk and cream cost $401,295, and the party ate just 443,440 pounds of butter. It required 364,759 pounds of coffee to stimulate the crowd and 24,700 pounds of tea.

It takes a lot more than these commodities, however, to feed thirteen millions. It took 41 cars of flour and 68 cars of potatoes, boiled, mashed, hashed brown, French fried and what not. There were apples, too, 15,870 boxes of them, 14 cars of oranges, and 22 cars of sugar.

Meat was needed. Travelers eat a great deal of it, just when they shouldn't. Look at Mr. Duffy's figures: 4,237 fat cattle turned, he says, into 529,508 pounds of loin steaks, 318,081 pounds of roast beef, and 139,300 pounds of other cuts. The traveling public consumed 40,870 hams weighing 588,000 pounds, 26,700 sides of bacon weighing 145,600 pounds, and 294,890 pounds of leaf lard!

Poultry demands also were heavy. It took 391,000 pounds of chicken, 133,400 pounds of turkey and 74,120 pounds of duck to serve this multitude. Immense quantities of fruits, berries, vegetables, bakery goods, ice cream and other products helped to complete the bill.

Feeding the traveling public has become a real science, if you take the word of Allan Pollok, manager of the Southern Pacific's dining car service. The old time cooks, the temperamental guys whom tradition associates with long, keen butcher knives and meat cleavers which they were said to wield rather deftly when agitated violently, these grouchy lords of the kitchen have disappeared—so it is said. Things, meaning food, are no longer thrown together. There is no more guess work. On the Southern Pacific exact measurements, and methods of preparation for every food specialty served on the dining cars, are given in a recipe book with which every cook is required to be familiar. Scientific training of cooks and waiters also is a part of the plan to make the service uniformly excellent. They receive careful training from traveling head chefs and waiters. School cars visit the various terminals frequently.

Like an army, the dining car must have an extensive service of supply. Much of the preparatory work is best accomplished before foodstuffs reach the dining car kitchen. Only in this way can unvarying satisfaction be assured to the patron.

In the new Ferry Terminal commissary at San Francisco blending machines have been installed that mix cereals and flours with other ingredients in accordance with approved rules for the making of hot breads, muffins, rolls, pie crusts and hot cakes. Baking powder, milk, eggs, sugar, salt, all are measured with the precision and exactitude of an assayer handling gold dust. The resulting mixtures are issued in labeled packages, and all the dining car chef has to do is open the package, add whatever milk or water may be required, and bake at the indicated oven temperature. Dining cars

A Corner in the Union Pacific's Commissary Store Room at Ogden, Utah.

use more than a ton of these blended products every day.

Much time is saved for the chef by advance preparation of salad dressings in commissary kitchens. Mayonnaise, Thousand Island, French dressing and other sauces are issued in glass containers, and as a result the patron enjoys a quality of dressing that could not be prepared in the hot kitchen or pantry of a dining car in rush hours.

In the commissaries all fresh meats are carefully boned, cut and issued to the cars in convenient form. Waste is almost entirely eliminated. Soup stocks are prepared in large quantities and this stock, properly refrigerated, is issued to dining car chefs in gallon jars. So exacting is the quality demanded for dining car service that the company maintains at West Oakland a well equipped butcher shop where all pork and meat sausages are made and where corned beef, and pickled tongues are prepared in accordance with the company's own recipes. Here, too, is a smoke house where all tongues and sausages used by the service are smoked.

Commissary kitchens are also used as schools of instruction for chefs. In these all cooks must prove their familiarity with every recipe in the official recipe book, and their ability to maintain through exactitude of measurements and care in preparation, the high standards of cookery demanded by the dining car service. Constant experiments are carried on to extend and improve advance food preparation. The new and commodious commissary opened at the Ferry Terminal is equipped to further these experiments in economy, time saving and quality standardization.

T. O. Edwards, general auditor, says nearly eight million meals were served during 1926 on the company's dining cars, steamers, and in restaurants. Overhead expense amounted to seventy cents a meal. The company's profit in the transaction was gained out of the definite advertising value of pleased patrons, because no railroad makes a cent on its dining service.

"During 1926," said Mr. Edwards, "we used 8,500 head of prime beef; 237,250 chickens; 3,648,352 eggs, or 10,000 eggs every day in the year; 1,045,341 pounds of potatoes; 70,870 gallons of cream; $162,120 worth of fruits; 206,000 pounds of coffee, enough to overflow a tank holding 307,000 gallons; 221,000 pounds of lard; 259,000 pounds of butter; 192,000 gallons of milk; 293,000 pounds of ham and bacon; 253,000 pounds of fresh pork; 233,000 pounds of lamb."

The public has little understanding, perhaps, of the care taken to insure cleanliness and service. Inspection frequent and thorough is the chief point. Everything, literally, is opened and looked into, although the company's inspectors really are instructors teaching the men out of their greater experience, to do better work. The purpose is not to search out deficiencies and dwell upon them, but to offer friendly cooperation and constructive criticism. The dining car crews expect to be closely watched and are always prepared. The cars are always inspected on leaving a terminal and on arrival at destination, and usually at least once or twice en route. The din-

Vegetables of Many Kinds to Tempt the Appetites of Transcontinental Travelers on the Overland Limited.

Poultry in the Cooling Room.

ing car crews are old hands, and in fact it is because of their service and close association that they are able to get the splendid teamwork which makes the efficient operation of a diner possible.

Buying, of course is done by experts, in large quantities, and woe be to the seller who tries to get away with anything. It would be the last time. Everything must be fresh, clean, up to standard.

When a passenger enters a dining car and is greeted courteously by the steward, seated at a table having spotless linen and shining silverware and served promptly and efficiently, thought is seldom given to the many exacting details involved in the operation of a dining car. The chef is a mighty person, of course. The work he does, the things he sends out, must be right. But the steward, the man who faces the public, must not only be a diplomat but also he must know his job from A to Izzard and back again. John H. Laughren, Jr., one of the Union Pacific's competent stewards on that road's famous Overland Limited, writes interestingly of what goes on behind the scenes.

The dining car crew, says he, shows up three hours before time for the train to leave to stock the car, and get ready everything possible for the first meal to be served. The steward orders supplies for the trip and sees that they are properly inspected and checked into the car from the commissary store-room. Clean linen in an even exchange for soiled pieces is issued at the same time.

Passengers often wonder where everything required can be stored in a diner; it takes skill equal to a woman's in packing a trunk in the days when women's clothes needed plenty of space. Storage facilities in a diner must be exceedingly compact. In the kitchen there is refrigeration space for meats, fish, poultry, milk and other perishables, as well as for the various staple supplies assigned to the kitchen. In the pantry are refrigeration boxes for fruits, vegetables, cream, ice cream, bottled milk, butter, etc. The pantry also provides storage space for bread, canned goods, condiments and various staple supplies. The linen is kept in conveniently located linen lockers. Mineral waters, beverages, cigars and cigarettes are kept in special lockers, under direct supervision of the steward.

Auxiliary supply boxes are underneath the car body, providing both refrigeration and dry storage, and here are kept the surplus supplies which cannot be taken care of in the dining car lockers.

The steward must be fully informed as to the variety of fruits, vegetables and specialty items available in the different seasons, and in the territories through which his car operates.

In making out the requisition for supplies required at the start of a trip, the steward must rely on his experience to determine the quantity of the different items to be carried on his car. However, there may be more passengers

Prize Winning Stock in the Orange Shows Is Bought Eagerly for Dining Cars.

Boxes of Meat, and a Smile.

on the train than had been expected, and in emergencies of this kind the steward wires ahead for additional supplies which can be obtained from intermediate commissary stations or from the hotels and restaurants at various points.

The crew of a diner consists of steward, chef or head cook, second, third and fourth cooks and seven waiters. One of the waiters, in addition to waiting on guests, has charge of the pantry and is called the pantryman.

The chef has supervision over the kitchen. He must be a thoroughly experienced and capable cook, and at the same time be able to exercise careful control over the work performed by the second, third and fourth cooks. The chef is required to cut all meats, do the broiling, make soups and sauces, see that all food served from the kitchen is properly prepared and served in keeping with the instructions. He gives particular supervision to the making of coffee, also pastry and other baking. The second cook does all range work and handles the pastry work and baking. The third cook prepares the vegetables to be served, looks after serving and hot bread, etc. The fourth cook is dishwasher and general utility man.

A successful waiter must be neat in his personal appearance and dress, and affable and earnest in his efforts to please the patrons. He must be intelligent and reliable in his habits. He should have an understanding of the details of correct service, and for this reason it is the general rule that some previous experience in hotels or clubs is required.

Necessarily, the steward must be a real caterer. As a rule some previous experience in first-class hotels, restaurants or clubs is required before it is possible to obtain a position as steward. The steward must be of neat personal appearance and in his manner of dress, and must of necessity be thoroughly dependable. You never see a frowzy steward. There aren't any.

A School for the Cooks

A number of the leading railroads have cooking schools, but the Illinois Central has carried the instruction one step farther. A car has been equipped with the same type of range and cooking utensils as those used on the Illinois Central's standard dining cars, so that instruction may be given employes in that department wherever they may be but particularly when they are unable to go to headquarters to attend the regular school. This school for cooks begins at 9:30 o'clock every week day after the morning trains have arrived, and continues in session for an hour and a half or more. Instruction is given by the traveling chef. The first lesson, logically, is directed to the preparation of breakfast, the second the luncheon, and the third the dinner. No cook is permitted to take the second lesson until he has completed the first satisfactorily and is eligible. Stewards are expected to attend the lectures with their crews as observers so that they too, may know what is being taught. The whole purpose on the Illinois Central is to standardize the dining car service at the highest possible level. A good deal of attention is given to teaching courtesy which, as most travelers know, is a very important part of the meal.

Musical notes from a dinner gong have replaced the old familiar, "Last call for dinner; dining car's ahead," on Missouri Pacific dining cars. Dinner gongs were placed on all Missouri Pacific dining cars March 1. Now, instead of passing through the train calling out that meals are ready, the waiters will sound the welcome news on the tinkling chimes.

Fast Air Service

A mail schedule of five hours between San Francisco and Los Angeles and Seattle is being maintained consistently regardless of weather conditions by Pacific Air Transport pilots.

Fresh Meat Is Cut Into Proper Portions for Dining Car Uses.

The Challenge to Efficiency

A Fuel Convention Keynote

By W. B. Harper

DISTANCE has served in America as a challenge, a spur to generation after generation of pioneers, and the conquest of it still remains an incentive to engineering and business genius. The long haul is distinctively an American problem. There is commonly a long gap between the areas of large production and areas of heat consumption. This geographic separation of demand and supply may be measured by thousands of miles, but it gives the railroads their place in the picture. The long haul is one of the elements in the high cost of living, for distance discounts the blessing of abundance.

President Gray

This, briefly, was the keynote of the interesting address of Dr. George Otis Smith, director of the U. S. Geological Survey, following the formal opening of the 19th annual convention of the International Fuel Association in Chicago, May 10, at the Hotel Sherman. F. E. Chapman, A. T. & S. F. Ry., the president of the association, presided. The attendance was unusually large.

"This conquest of distance is the big task set for you railroad men," Dr. Smith said. "As I view it, there are two, and only two, ways of conquering distance, reduce the number of miles or cheapen the miles. To a man with a wheelbarrow only one of these methods is open, even in theory, and that is to select the shortest route. This convention is the railroad's challenge that efficiency in operation is another way to conquer distance. During the war period, when a shortage of cars and locomotives forced us to discover economic short cuts, one such device was the zoning of coal shipments. The principle back of that emergency device was correct, it saves transportation by eliminating cross-hauls. The public needs an economical distribution of products perhaps even more that it needs lower freight rates.

"Minimizing distance is the great public service rendered by two types of railroad engineers, the one whose skill selected the best route, the other whose efficiency wins from the locomotive the best performance. The public service duty of the railroads, then, is to help in working out economical distribution both by reducing the length of haul and by cheapening that haul. The ton-mile cost of transportation is not to be escaped; it is a tax that cannot be dodged. Growth in railroad mileage has practically stopped, but increase in ton-miles has not. During the present century there has been only about a 25 per cent increase in trackage, yet last year the ton-mile record was not only the highest ever reached, but the railroads handled as many revenue ton-miles in those 12 months as in the first three years of this century combined.

"It is gratifying from the public standpoint to find in the record of fuel performance in 1926 a measurable improvement in both freight and passenger locomotives. Thus this year's improvement over the excellent record of 1925 was barely a 2 per cent yet the railroads are the largest consumers of coal, and even that small saving means millions of tons, truly a big item in any program of conservation.

"Lowering the cost of ton-miles is cutting down the price of distance, but fuel economy does even more than that; it saves energy. That is why it is a privilege as well as an honor to speak to men who are so active in promoting fuel economy."

President Carl R. Gray of the Union Pacific System, referred to the assistance given to the railroads by the members of the association who are directly engaged in engineering design and other duties relating to the manufacture and sale of locomotive fuel saving devices, many of whom received their training in railway service; also to the services of the men who get out the nation's coal, of which from 25 to 28 per cent of the year's output is consumed by the railroads. He congratulated the association upon its growth from a membership of 35 in 1908 to 1500 at present.

"During the war," said Mr. Gray, "when the railway fuel problem and its utilization became a pressing one and the fuel conservation section was created under the U. S. Railway Administration, one of the first things we did was to turn to this association and solicit its aid and cooperation. The response was immediate and heartening, and the records of your association for 1918 tell the story. It was then that the task of saving fuel, coal and oil, took on added impetus, an impetus which has

continued to this day and will be the inspiration for the future.

"The period of so-called federal control initiated a new era in railway affairs, and resulted in a new railroad psychology. No longer is there an inferiority complex among railroad men; no apologies, but a strong and virile spirit, with a determination for public service of the highest and most inspiring character. In the period of government control there was an opportunity not only for the people of the United States to take stock with respect to their transportation system, but it also gave the railroad men an opportunity to take stock of themselves. The public learned probably for the first time the fundamental importance of these steam carriers in the national prosperity. The railroad men learned for the first time, perhaps, certainly as a class, that they had overlooked the very important element of the public interest. The public decided, almost unanimously that it did not want government operation. The railroad men decided they would do nothing that would contribute to such a result.

"Then came, after mature deliberation, the Transportation Act of 1920 by which the public, for the first time, assumed responsibility for the railroads. As expressed in that law, there must be a dependable, efficient, national system of transportation. The railroad men and the public had learned that the interests of the railroads were mutual; that they must not be regarded as individual roads, but as units of the national system of transportation, which had to be reciprocal and effective in all its parts.

"As that conception grew on the part of the railroads, they began an effective system of cooperation, which grew to such an extent that it is fair to say that over two and a half million freight cars in this country became a common possession moved to meet the necessities of a situation wherever or upon whatever line it might be. Such a thing as a continuing car shortage, the kind that plagued the business world for generations, is now unknown; congestion, with all its attendant difficulties and loss, is a thing of the past.

"The changed attitude of the public is reflected in the press and the legislative mind. The legislatures in all the states of the Union met two years ago and adjourned without passing a single anti-railroad bill, and those which met this year, have not had under serious consideration any bills to punish the railroads, as in the old days.

"With regard to the railroad fuel problem, the figures prepared by the bureau of railway economics show that while, in 1920, the pounds of fuel used per 1000 gross ton-miles in freight, service on all Class I roads was 197, a continuous reduction has taken place annually until the splendid showing of 155 pounds was made in 1926, a reduction of 21 per cent. The unit consumption for passenger service went down proportionately.

"And so the work of cooperation and betterment has grown apace. Our railroads as an effective, smooth working machine built for service and giving it, lead the world. The same splendid technique and operating efficiency developed in our larger manufacturing industries, such as the steel, the locomotive and the automotive industries, have been attained by the railroads and railroad men. Our friends in the coal industry are rapidly developing newer and better mining methods, and in spite of occasional exceptions, the labor relations that exist within the coal industry are taking on a newer and more constructive tone."

Dr. H. Foster Bain, secretary of the American Institute of Mining and Metallurgical Engineers, spoke on "Railways and the Mining Industry." There is a natural and necessary community of interest between the railways and the coal industry, he said, for 30 per cent of the bituminous coal mined in the United States and 5 per cent of the anthracite is used by the railroads, while in 1925 of the freight carried by the Class I roads 35.8 per cent consisted of coal and coke. If other mine products be added, it appears that 52.7 per cent of the freight handled came directly from the mines. The community of interest, therefore, is not only between the railways and the coal mines as the source of their fuel, but between them and the whole mining industry as the source of most of the freight.

"The debt of the roads to the miners is even deeper," said Dr. Bain, "Fuel, and especially coal, is the principal source of the energy which makes possible this, our mechanical age. Without fuels we could not as a nation, manufacture the volume of goods which characterizes the present period, and manufactures constitute nearly 24 per cent of the freight handled by the roads. A very large part of the manufactured goods, furthermore, are made from metals and mineral products. It is the great volume of material that comes from the mines which forms the backbone of freight for the roads, just as the freight in turn forms the backbone of the revenue.

"It is equally true that without the roads the mining industry necessarily would have continued to consist of a series of small local units. Without the power to distribute output over a wide territory, a power placed at the service of the mines by the roads, there could hardly have been mines and works of size; and size and regular output are essential to those economies in the operation which permit lower prices and so open additional markets.

"Coal is the principal fuel of the modern world, and fuel is doing a larger part of the world's work than is generally appreciated. Two pounds of coal properly utilized will do the work of one man one day. It has been by putting the fuels to work that modern people have so greatly increased their productive capacity.

"It is now generally understood that mineral deposits are definitely exhaustible. There is only one crop to be won from a mine, and a time comes when every mine is worked out. This is a powerful argument for careful development of our mineral wealth, and for wise use of the minerals once they have been mined. As to the fuels, they are not only exhaustible as deposits, but are destroyed in use. Fortunately of coal, the most essential fuel, our country contains a supply sufficient to last a very long time; and with wise conservation and correct methods of utilization, no alarm need be felt within the period that it is feasible to consider in human affairs, a matter of centuries. Fortunately also it is possible to derive from coal, gas and oil to substitute for the valuable natural fuels that now come from the wells. It will be for the financier and the technologist to work out means of doing this at a cost not out of proportion to that of other commodities."

C. B. Page, mechanical engineer, the Steam Motor Co., Chicago, presented a paper on the development of the turbine locomotive with special reference to the problem of smoke elimination and fuel economy. Mr. Page declared that if turbo locomotives were used in and out of Chicago's railroad terminals it would result in a great reduction of the city's smoke as this type of locomotive emits practically no smoke when properly designed and drafted. It also makes much less noise than the ordinary steam locomotives, the usual puffs or blasts of steam not being heard, he said.

"The turbo locomotive is much more economical than the ordinary steam locomotive," said Mr. Page. "The first cost is a little greater, but subsequent gains in operating economy will run as high as 50 per cent over the corresponding piston type of engine. As pure water is always used in a condensing turbo locomotive, there is practically no need to wash the boiler, and boiler maintenance is therefore greatly reduced."

Among other valuable and interesting papers presented during the convention were those by L. K. Sillcox, general superintendent, motive power, C. M. & St. P. on "The Real Cost of Locomotive Fuel," and "The Economies in Long Engine Runs," by T. H. Williams, assistant general manager, Southern Pacific. Mr. Williams's paper appears elsewhere in this issue.

Capital Expenditures Increased

Capital expenditures by the railroads for new equipment and additions and betterments to property used in connection with the transportation service amounted to $885,086,000 in 1926, according to complete reports for that year just received by the bureau of railway economics and submitted by the bureau to the board of directors of the American Railway Association meeting in Atlantic City May 26. This was an increase of $136,895,000 over similar expenditures in 1925 and an increase of $10, 343,000 over 1924. It was, however, a decrease of $174,063,000 compared with 1923.

Of the total capital expenditures in 1926, $513,164,000 were for roadway and structures and $371,922,000 for new equipment.

Expenditures for new equipment in 1926, while greater by $33,808,000 than in 1925, were less than in 1923 and 1924.

During the four years from 1923 to 1926, capital expenditures of the railways aggregated $3,567,170,000. Of this total, $1,681,801,000 or 47.1 per cent was appropriated for the improvement of roadway and structures, while $1,885,369,000 or 52.9 per cent was put into new equipment. The proportion of total capital expenditures devoted to equipment has declined since 1923, the percentage being 64 per cent in 1923, 56 per cent in 1924, 45 per cent in 1925 and 42 per cent in 1926.

Capital expenditures for additional track in 1926 amounted to $166,758,000, which was an increase over the corresponding period in the three previous years, the increase over 1925 alone having been $21,000,000. For heavier rail in 1926, capital expenditures amounted to $42,184,000, which also exceeded the corresponding amount in the three previous years. This was also true of expenditures for additional ballast which, during the past year, amounted to $16,520,000. For shops and engine houses, including machinery and tools, capital expenditures in 1923 amounted to $46,882,000. While this was a substantial increase over the two preceding years, it was a decrease of $4,300,000 compared with such expenditures in 1923.

Capital expenditures in 1926 for equipment totaled $371,922,000, an increase of $38,808,000 over such expenditures in 1925 but a decrease of $121,686,000 under 1924 and a decrease of $309,802,000 under 1923. For locomotives during the past year, expenditures amounted to $108,263,000 which were larger than those made in 1924 and 1925 but were about one-half those made in 1923. For freight train cars, the railroads last year spent $185,792,000, the smallest amount expended for such purposes in the past four years, while $58,117,000 were expended for passenger train cars, the greatest amount for any year in the past four years. For other equipment, $19,750,000 was spent.

The Worm Turns

R. H. L.: Up here in these snowbound sticks the train was many, oh, many, long hours late. When it finally came the big, well fed, bald and florid commuter, fuming at the conductor, got this reply: "Well, big boy, if you don't like our train service use your auto like you did all the rest of the year."—Chicago Tribune.

Long Runs Save S. P. $60,000 a Year

An Economy in Operation

By T. H. Williams

Asst. Gen. Mgr. Southern Pacific

I THINK it can be safely said that the Southern Pacific Co. is one of the few railroads that pioneered the long locomotive run. Our company for many years has been running its engines over long distances. For example, in passenger service we run our engines through from Sparks, Nev., to Ogden, Utah, a distance of 536 miles, and from Gerber, Calif., to Portland, Ore., a distance of 533 miles.

In addressing you on the subject of economies of long locomotive runs, I shall confine myself to the district between Los Angeles and El Paso, for the reason that this is partly under my jurisdiction and was entirely under my charge when we started in January, 1924, to run our engines between these two cities, a distance of 815 miles.

I have prepared the accompanying chart to give you a picture of the profile of our line, grades, distance between terminals, and other information pertinent to this subject.

In January, 1924, we were operating eight trains a day; six between Los Angeles and El Paso, and two between Los Angeles and Tucson; that is, four trains a day in each direction.

An address before the International Fuel Conference in Chicago, May 19

Prior to the time we started to run our engines through it required 40 locomotives to handle the eight trains, which included sufficient power to handle the pool of runs and to take care of relief work and the shopping of the engine.

These 40 locomotives consisted of: Mikado, 2-8-2 type; Pacific, 4-6-2 type; Ten Wheeler, 4-6-0 type; Atlantic, 4-4-2 type.

These engines were assigned as follows: Between Los Angeles and Yuma, a distance of 252 miles, we used the Mikado engine. On two of these trains we used the Mikado engine between Los Angeles and Indio, a distance of 130 miles, and at Indio these engines were relieved by Pacific type power, the latter engines making the run from Indio to Yuma, a distance of 122 miles.

At Yuma the Ten Wheel engines were used for the run to Tucson, a distance of 251 miles.

At Tucson Mikado engines were placed on the trains for the run from Tucson to Lordsburg, N. M., a distance of 164 miles.

At Lordsburg, Pacific and Atlantic type engines were placed on the trains for the run to El Paso, a distance of 148 miles.

Thus you have a picture of the way these trains were handled prior to the time we started to run our locomotives through between Los Angeles and El Paso; and, as you will observe, this provided for five sets of locomotives, making four changes at intermediate terminals in the 815-mile run.

In January, 1924, we placed in service 10 Mountain type 4-8-2 class engines to run through, and discontinued cutting engines in and out of trains at all of these district and division terminals.

Later, as more of the Mountain type engines were received, we filled the pool with a complete complement of this class of power. Today, we are running 10 passenger trains a day, five in each direction between Los Angeles and El Paso, and have 25 Mountain type engines assigned to the through service. This is sufficient to take care of relief work and provide for shopping.

For a long time we ran these engines without the protection of having an engine of this type at intermediate terminals to protect in case of engine failure, but recently we established the practice of changing one engine out at Tucson and one at Yuma on one westbound passenger train every day. We did this to give us an engine at these two points for pro-

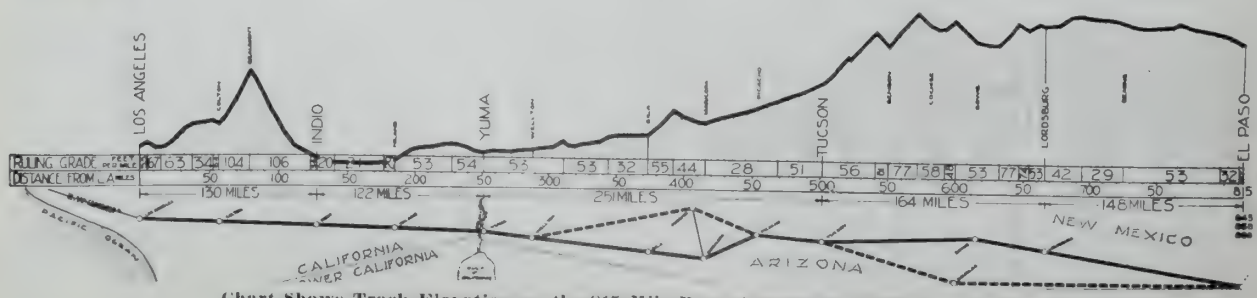


Chart Shows Track Elevation on the 815-Mile Run of Southern Pacific Locomotives.

tection in case of engine failure, and to equalize the mileage made by the total engines employed in the pool.

To handle the 10 trains a day under the old method of operation of changing engines at district and division terminals it would require 50 locomotives, while under our plan of running the engine through it requires 25. We have made a 50 per cent reduction in the total number of engines required for the service under the present plan of operation.

Since January, 1924, the date we started to run the engine through, we have constructed a new main line in Arizona from Wellton to Picacho via Phoenix, which has added 44 miles to the run to El Paso, and gives us a double track line between these points, Wellton and Picacho.

We have also acquired the El Paso & Southwestern R. R. running from Tucson to El Paso, giving us a double track line between these two points, and increasing our mileage via this route 29 miles in the total distance between El Paso and Los Angeles.

By the construction of the new line through Phoenix and the acquisition of the El Paso Southwestern and the scheduling of our trains over these new routes we have increased the run of the Mountain type engine from 815 miles to 843 miles, 858 miles and 888 miles.

These engines, after the run of 888 miles, have an average layover at El Paso of 14½ hours, and at Los Angeles 26 hours.

In connection with the design of the Mountain type engine:

The engine weighs loaded, 610,300 lbs.
Traction effort with booster, 67,760 lbs.
Cylinders, 28 inches.
Stroke, 30 inches.
Boiler pressure, 210 lbs.
Tender capacity: water, 12,000 gals.
oil, 4,000 gals.

We are now constructing eight of these engines in our shops at Sacramento with a water tender capacity of 16,000 gallons.

These engines, in the run of 888 miles, take fuel at four points en route, but the tender has sufficient fuel capacity to take oil only twice en route. The reason for taking fuel four times is to save the long haul of oil to distant points from the oil fields.

These engines make long runs for water, the longest run being 160 miles from Aqua, Ariz., to Picacho, Ariz.

We now come to the question of economies in long locomotive runs, which is the subject on which I was invited to address you.

First, let us show what has become of the locomotives formerly employed, particularly the excess number of locomotives required to perform the service when they were working on short runs and were changed out at district and division terminals.

The Mikado engines are hauling heavy freight trains on our Salt Lake and Rio Grande divisions. The Ten Wheelers are hauling 100-car freight trains on the Stockton, San Joaquin, and other valley divisions. The Pacific and Atlantic type engines have been re-assigned to valley territory where best fitted for the needs of our business.

Six months after we started to run our engines through over this 815 mile territory, we took off enginehouse forces at the intermediate terminals to the extent of saving us $8,000 a month or $96,000 a year. It takes no stretch of imagination to know that it requires man-power to move engines to sand house, oil and water columns, put them across turntable and into enginehouse. We have saved all such enginehouse attention and handling at these intermediate terminals.

In enginehouse fuel, prior to the time we started to run the engines through, we consumed 66 barrels of oil a day, which at the price we were then paying for oil, amounted to a saving of $2,692 a month, or in round figures, $32,000 a year.

We have made substantial saving in cost per locomotive mile for classified repairs. The pool of 40 engines employed before we started the long locomotive run averaged 76,943 miles per engine between shopping periods for classified repairs. Last year the pool of 25 Mountain type engines now running through made an average of 116,827 miles per engine between shopping periods for classified repairs, an increase of 50 per cent. Some of these engines are making over 14,000 miles a month.

The cost per locomotive mile for classified repairs on the pool of engines employed in the service before we started to run the engines through was 9.203 cents, and after running the engines through with a new type of engine assigned, the cost was reduced to 7.71 cents per locomotive mile, a decrease of 16 per cent.

This decrease is due in part to less abuse of the Mountain type engine on account of its adaptability to work required over this territory as compared with the former locomotive used.

The greatest factor of decreased cost per locomotive mile for classified repairs, in my judgment, is the saving of the metal of the boiler. We now cool the engine down once where we formerly cooled the engine four times.

In capital investment in this one pool of engines we have saved $571,045, and with interest at 6 per cent and depreciation at 4½ per cent, this gives us an annual saving of $59,960 a year.

Shippers and travelers are getting the best railroad service and the lowest rates of any country in the world. Statistics prove these statements. This record of private management, when compared with two years of federal control and the $1,600,000,000 deficit which fell on the taxpayers to pay for the two-year period is a remarkable testimonial to the efficiency of present railroad management.—Cumberland (Md.) News.

Building A State in Miniature

A Dental Motor for the Railroads

By Walter W. Ames

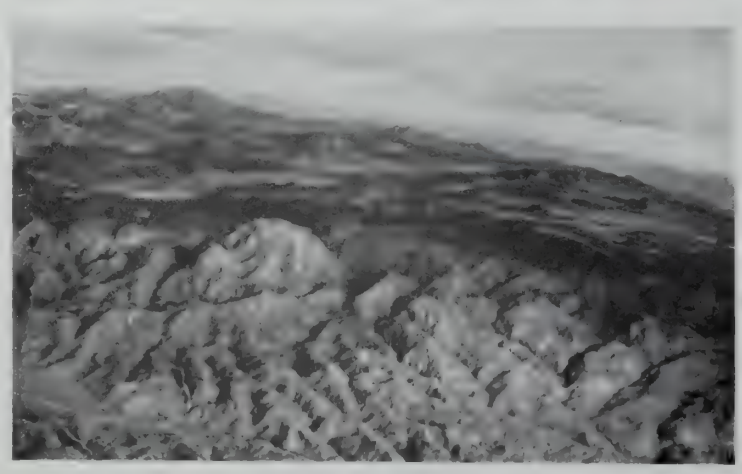
EVERY railroad in California is shown in identifying colors, along with many other interesting things in the 600-foot panoramic relief model to be seen now in the Ferry Building at San Francisco. Apparently nearly everyone is interested in models. Thousands inspect the panorama daily.

A Dentist's Motor Supplies Power for This Miniature Sawmill Used in Model Work.

In addition to railroad systems the model shows the scenic and historical places for the special accommodation of tourists, as well as every important city, beach, mountain, valley, lake, river, and highway. Observers view the display as if from the Pacific ocean. Instead of looking through glass panels in frames, however, the public gazes through clumps of sequoia, so grouped as in no way to detract from the view. Beyond the model is a painting of master artists showing the distant mountains and the sky. The model extends along the wall of the nave of the spaces allowed at the transepts so that persons may pass to and from the ferries. From the wall the model projects into the nave 17 feet 6 inches throughout the entire length. Large cities such as San Francisco, Oakland, Los Angeles were built in detail, showing the office buildings, public buildings, schools and churches. In order to give the effect of daylight, large spotlights were directed against the front of the larger cities. County seats were built on a flat piece of glass with an electric light placed in a vertical position under the glass which permits the light to pass through the glass and shine on the front of the buildings bringing out the details.

A dental motor with flexible shaft was used in operating saws, drills, and emery wheels, and for sawing strips 1-16-inch thick in various widths to represent blocks of houses. This little motor served also in building the railroad lines, an emery wheel being attached to the end of the flexible shaft, which was used in grinding the railroads out of the mountain sides, the road being widened in the foreground and diminishing in width as the roads "faded out" in the distance, thus giving them the proper perspective. Miniature railway trains were placed at various points on the railroad systems, and every important railroad bridge was shown. From 25 to 30 men worked for eighteen months to complete the model. The cost was $100,000.

From maps and photographs there was constructed a large map of this state in sections, the scale being six inches to a mile. After completing this map a wooden platform was built of flooring supported on horses at the same elevation that the finished model would occupy in the Ferry Building. Then the map was reproduced on the flooring with pencil, after which the rivers were painted in blue, and the coast lines were cut out. Work was then started on the elevation of the mountains, working from government maps from the lowest point to the highest peaks, using triangular shaped redwood blocks one inch thick to represent different mountain heights. These blocks were nailed into place, diminishing in size until the lowest planes were reached. Wire netting was then nailed to the wood blocks, after which the burlap dipped in a thin coat of magnesite was laid on the wire netting.



In the Lower Left-Hand Corner the Miniature Railroad May Be Seen in the 600-foot Panorama.

Railroads Are Eliminating Waste

Division VI Urges Economies

By W. J. Patton

JUST how important an effect on business is exercised by American railroads is pretty clearly shown in the reports and addresses delivered in the meeting of Division VI, Purchases and Stores, at the Palmer House, Chicago, May 24-26. Fuel, materials and supplies bought by the railroads in 1926 cost more than a billion and a half dollars, an interesting fact developed by W. G. Besler, first vice president of the American Railway Association, and chairman of the board of the Central R.R. of New Jersey.

A committee report showed that in the last year the railroads spent nearly 28½ million dollars for stationery and printing. Of this stationery bill, the report showed practically all of it for printing freight and passenger tariffs, including the cost of the paper. The railroads spent 22 million dollars for this purpose in 1925.

An interesting feature of the meeting was the presentation of prize winning papers, the first award going to H. F. Burnett, general foreman stores department, Kansas City Southern Ry., Pittsburg, Kan., and the second to James M. Day, foreman of stores, Southern Pacific Co., West Oakland.

The important work done by the members of Division VI was described by the chairman, D. C. Curtis, chief purchasing officer of the C. M. & St. P. These members, he said, order, buy, receive, house and distribute material worth one billion 700 million dollars a year. They are responsible for material necessary for repairs, maintenance and protection of 75,000 locomotives, 2,653,000 freight cars, 62,900 passenger cars, 500 rail motor cars, thousands of signals, numberless materials for track work, buildings and bridges, and the necessary supplies for the feeding, comfort and care of millions of patrons scattered over 275,000 miles of railroad. These materials are represented in practically every line of manufacturing and production in the commercial world. There is an investment in stock of material at all times of approximately 575 million dollars.

"There is much to be done on our railroads in reducing the costs of handling materials," said Mr. Curtis, "from the time they are received until actually delivered to the user where wanted. Handling material adds to its cost, but not to its value. The gasoline tractor, the gasoline truck, the electric lift truck, the electric crane truck, the gasoline crane truck and the ramp truck, have been developed very recently, even since our last convention, and we can probably find no greater opportunity for savings than by giving this problem persistent, consistent and coherent thought during the coming year. The number of common laborers to the total population decreased 2.2 per cent in 1925, and the fact of a decrease in available labor, is forcing a change in our handling methods. The Chicago Journal of Commerce recently made the statement that the people of the United States were wasting a billion dollars a year in the handling of materials and supplies. While the railroads contribute to this waste, there is no doubt they have made as much progress in handling facilities as the commercial world.

"There is a very great need for improvement in our cost keeping methods. The manufacturers of many commodities used on our railroads are constantly and forcibly bringing to our attention the fact that in attempting to manufacture materials on our own railroads and in our shops, we are deceiving ourselves in many cases, as our cost keeping methods are not taking into account all the factors of cost. We must find ways of knowing our entire cost, so that we will know that we are not paying more to manufacture material ourselves than we can purchase it for from specialty manufacturers. We also must know the effect on the manufacturers in their development as agencies for the production of commodities for transportation, as transportation is the one thing we have to sell and upon which depends our success or failure."

Chairman Curtis said the practices recommended by Division VI have reduced the inventories for Class I railroads in the United States, in 1920 from a total of $755,563,278 to $525,853,107 in 1925.

"The current buying, or buying for immediate needs," said Mr. Curtis, "forces simplification and standardization, for if quick deliveries are to be had, they must not require special processes for their manufacture. However, there is another side to this question that must be given due consideration. The cost of producing was increased one-fifth in 50 years, but the cost of preparing and selling has increased three times. In 1870, 10 per cent of the workers in the United States were engaged in the process of distribution, and in 1920, the percentage had risen to 25 per cent, most of this increase being with the wholesalers and retailers."

Interesting recommendations in

the interest of saving, by the committee on printing and stationery: powdered ink and mucilage; mechanical pencils instead of wooden pencils now used by many roads; abolition of pencil sharpeners; limitation of pens not to exceed five sizes or kinds; use of blank paper for inter-departmental communication; limitation of rubber bands to five sizes; and the greater utilization of typewriter ribbons and carbon paper.

The report also urged the more restricted use of common pins and the limitation of the pins used to one size. One of the large railroads reported that it uses about 13 million pins annually. By changing the specifications from brass to steel pins that road has reduced by $1,500 the annual purchase of mere pins.

The importance of extending the scope of standardization and simplification of materials as a further means of bringing about still greater economy and efficiency in the operation of the railroads was urged in a report submitted by the committee on that subject. Simplification of stores stock by reducing the number of items, according to the committee, is productive of numerous economies, among which are: More economic purchases due to smaller number of items ordered, eventual reduction in manufacturing costs of various items, and elimination of special material which involves higher prices; more economy in bookkeeping and better control of stocks; smaller stock balances, and less storehouse space and consequently more convenient and economical arrangements of stock.

"Numerous roads," said the report, "have already adopted plans looking to this end but the committee feels that this work can be extended so as to include a larger number of parts for mechanical and other appliances. At the termination of federal control, for instance, the total number of items of material and stock on the Pennsylvania Railroad approximated 150,000. This number has since been reduced to 63,300. This is representative of what other roads are also doing in that respect. One railroad, by making a systematic study of certain items, has been able to eliminate 24 sizes of copper tubing, 18 sizes of brass tubing, 93 sizes of cold rolled steel tubing and 1,289 fabricated steel car parts. The stock investment savings on the steel car parts alone is approximately $43,000 based on normal quantities previously carried compared with what is now carried. There is a field for study in parts for mechanical and other appliances. Oftentimes standard commercial items can be utilized in preference to the manufactured specialty."

In accordance with the general policy of the railroads to bring about greater efficiency and economy in operation, substantial savings are being realized by the carriers from the reclamation of old materials.

Through the reclamation work now being conducted by the railroads of this country, some use is made of practically every bit of material just as long as it is possible and economical to do so. As indicative of the extent to which this work is being conducted, old metallic roofing and empty powder or carbide cans are converted into tin buckets, cups and other tin ware while old broom handles and other mill refuse are made into staffs for signal flags such as are used extensively by the railroads. Scrap locomotive tire steel is being converted into hammers while even old hose is being used for the manufacture of baggage mats. Canvas, which has reached the end of its usefulness for the purposes for which it was originally bought, is sent to the upholstering shops of the various railroads and there worked over into aprons for workmen, locomotive steam pipe covering and for other purposes. Broken leaves from springs are made by the reclamation departments into elliptic springs while flues, which can no longer be used in locomotive boilers, are flattened and made into washers. Bolts are straightened and rethreaded, old timber cut into planks for crossings and other purposes, second hand rail is made into guard rails, car wheels which have become flat are again made available for use by grinding, while oily dirty waste taken from journal boxes is cleaned and re-oiled and again used.

Officers elected for two years were: chairman, A. S. McKelligon, general storekeeper, Southern Pacific Co., San Francisco; vice chairman, C. C. Kyle, purchasing agent, Northern Pacific Ry., St. Paul. Members of general committee, D. C. Curtis, J. E. Mahaney, G. E. Scott, H. C. Stevens, A. L. Sorenson, C. B. Tobey, M. E. Towner.

Fruits and Vegetables in Demand

Consumption of fruits and vegetables by the American public is now almost twice what it was ten years ago. This is shown by a study just completed by the bureau of railway economics as to rail shipments during the past ten years of the 16 principal fruits and vegetables grown in this country.

From 1917 to 1919 the annual average rail shipments of the 16 principal fruits and vegetables amounted to 478,540 carloads. For the years 1924 to 1926 the annual average was 848,099 carloads, which was an increase of 77 per cent compared with ten years ago. In contrast with this increase, the total population during that period increased only 12 per cent.

Increases in the commoner staples ran generally less than 100 per cent; white potatoes, for example, showed an increase of 46 per cent, sweet potatoes 60, apples 73, lemons 66, cabbage 63, onions 54, and tomatoes 83 per cent. Perishable products showed increases in excess of 100 per cent.

The Growing of Executive Timber

By

H. F. Burnett

Among These Applicants Doubtless There Are Future Executives. It Is the Supervisor's Job to Develop the Human Material He Gets.

COMPETENT man power, with able executives, is the underlying factor in the success of any organization. Cost saving, unit piling and stock control in being so thoroughly discussed and standardized has drawn attention from the human element phase of operation. With able men these problems will not be so difficult. Let us consider at this time our man power.

This is a subject chosen for the purpose of acquainting the younger officers of the purchasing and supply department with the dire need of properly preparing their subordinates to fill the more responsible positions, a subject which must be given deep consideration and thorough application.

What, in your opinion, is in the mind of the average applicant of today regarding his future when he applies for a position in the supply department? Do you question him, dig deep into his innerself and satisfy yourself that you are doing the proper thing in employing him; that he is really worth the chance you are placing before him? We are all aware of the opportunities that exist in our branch of the service and should be mindful of the fact that in placing a new man in our organization we have before us a task of no mean significance. He must be taught at the beginning the fundamentals of our department's activities. He must begin at the very bottom under our careful guidance and for this reason we should choose a man who we feel is going to stay so that our efforts shall not be in vain.

From our own experience we know that new men in the supply department, from whom will be picked the future executives, really profit most by being placed at the start in the material end of the game, rather than in the clerical capacity. We must remember the great advantage a man starting first on the outside and gaining first hand knowledge as to material has over the office man. He not only learns the names and terms of the many different items of material but also their uses. His constant contact with the men of the shop teaches him to appreciate the different shop difficulties and the value of our greatest asset "co-operation."

His outside experience will bring him in direct contact with the various foremen which, in the course of time, teaches him the essential points pertaining to the handling of men; their different attitudes, both physical and mental and how to deal with such great differences of personality.

It is an established fact that men brought up through the ranks with a thorough knowledge of material and its handling are best fitted for the higher positions of foremen and departmental heads. There is but one straight road to success and that is merit. The man who is successful is the man who is useful. Capacity never lacks opportunity. It cannot remain undiscovered.

All business as now conducted requires specialized training and technical education; in fact it is becoming so widespread that the distinctive line between business and

—Mr. Burnett is general foreman of stores, Kansas City Southern Ry. at Pittsburg, Kan. His paper was chosen for first prize by a committee in the Purchases and Stores convention at Chicago.

profession is fast disappearing. Anyone who hopes to achieve success, even in a moderate degree, must know more or at least as much, about some one thing as any other one; and not only know, but must be able to utilize his experience and knowledge for the benefit of others.

In considering a new applicant even if he is to be placed as a laborer, question the extent of his education. Any schooling he may have above the average common grades is a premium. He should be comparatively young, clean cut, well balanced mentally and physically. A man with a surly disposition will surely disrupt any organization.

It is imperative that the store department foreman and executives must not only give a great deal of thought to educating their employes but must be leaders themselves in the many available opportunities that exist. Encourage them to attend the night schools. Take for instance the railway magazines published monthly pertaining to shop as well as stores and purchasing department's practices. They contain instructive material and you might choose articles of interest and write your men asking them to submit in writing their personal comments. It not only makes them think but is constructive as well.

The thought of promotion must be given considerable consideration. If you have a man possessing ingenuity and ambition enough to warrant it, it is a good plan to switch him around occasionally. Move him from the laborer's duty to trucking and from there to your receiving and shipping departments; place him in charge of different classes of stock; encourage him to study the different peculiarities of material, their proper classification, etc.

Quite often the occasion arises when extra help is required in the office, especially during inventory time. Never miss an opportunity of this kind to use him there. It will broaden his experience for future clerical position as well as his knowledge as to the value of material.

The crying evil of the young man of today is the lack of thorough preparation and application. Cite him, for instance, to your own present position. It required years of study, application and determination on your part to attain that position and he, if he wishes to attain that desired end, must have ambition coupled with determination to struggle to gain it. What a man does toward personal advancement in his odd moments increases his mental activity and can only bring him profit in the end.

Time is the one thing he possesses. His success depends upon the uses of his time and its by-product, the odd moment. Each has a regular day's work that he does in a routine, more or less mechanical way, his checking, clerking or whatever it may be; so many hours each day and that ends it. But what about the by-product of his odd moments! He must think of the odd quarter of an hour in the morning before breakfast; the odd half hour after breakfast, the many idle moments he throws away during an evening. Those few moments, if utilized in pursuing an adaptable course of study, reading railway magazines or studying various catalogues, blue prints, etc., are wonderful opportunities, and constitute the by-product of his odd moments. He must be made to realize that the man who is always killing time is in reality killing his own chances in life, and that he who is destined to success is the man who makes time live by making it useful.

The germ of enthusiasm must be injected in your subordinates. Carry it in your own attitude and manner. It spreads like contagion and influences every fibre of your organization before you realize it. It means increase in production and decrease in costs; it means joy and pleasure and satisfaction to your workers; it means life, real and virile; it means spontaneous bedrock results, the vital things that pay dividends.

Enthusiasm is the greatest asset in the world. It beats money and power and influence. Single handed the enthusiast convinces and dominates where wealth accumulated by a small army of workers would scarcely raise any interest. Enthusiasm tramples over prejudice and opposition, storms the citadel of its object, and like an avalanche overwhelms and engulfs all obstacles. It is nothing more or less than faith in action. Faith and initiative combined remove mountainous barriers and achieve the unheard of and miraculous.

There is no more valuable subordinate than he to whom you can turn a job and then forget it in the confident expectation that the next time it is brought to your attention it will come in the form of a report that the thing has been done. When this self-reliant quality is joined to loyalty and common sense the result is a man whom you can trust. On the other hand there is no greater nuisance to a man burdened with the direction of affairs than the weak-backed assistant who is continually trying to get his chief to do his work for him on the plea that he thought the chief would like to decide this or that himself. The man to whom an executive is most grateful and whom he will work hardest and value most is the man who accepts responsibility willingly.

New men must be taught that the ability to think and love work is the key to the jewel box of success. The supervisor should believe in this idea; should give it out, the idea itself, tactfully, wisely and live it himself in his organization. If the new man has an idea, he must not save it for his own use only, but spread it. It is the best thing he has to give,

and therefore the thing that will bring the best back to him.

Suppose every employe should look at his own case as an exact parallel to that of his railroad. What does his railroad give for the money it gets from the public? Service, service in advance! The better the service that is given out the more money comes back. What does the railroad do to bring public attention to its service? It advertises; that is part of the service. Now suppose that he, as an employe, began giving his service to the railroad in advance of all hoped-for payment. Suppose he advertises his service. How is he to do either? He cannot do anything in the course of his duties that is not service from wearing a pleasant smile to helping his immediate apparent rival to get a raise. Everybody who looks at him sees his advertisement, the boss, his immediate chief and the head of the department.

A great deal of the joy of life consists in doing perfectly or at least to the best of one's ability, everything which he attempts to do. There is a sense of satisfaction, a pride in surveying such work, a work which is rounded, full, exact, complete in all its parts, which the superficial man who leaves his work in a slovenly, slipshod, half-finished condition can never know. It is that conscientious completeness which turns work into art. The smallest task, well done, becomes artistic.

There is no philosophy by which a man can do a thing when he thinks he can't. The reason why thousands of men are plodding along in mediocrity today, many of them barely making a living when they have the ability to do something bigger, is because they lack confidence in themselves.

The man who is continually hesitating as to which of two things he will do first, will do neither of them. The man who resolves but suffers his resolution to be changed by the counter suggestion of a friend, who fluctuates from place to place can never accomplish anything real or useful. It is only the man who first consults wisely, then resolves firmly, and then executes his purpose with inflexible perseverance, undismayed by those petty difficulties that daunt all weaker spirits, that can advance to eminence in any line.

Volumes have been written and sermons preached on personal efficiency and general efficiency and every other kind of efficiency, which is all very fine, but set up the following precepts and see that they are followed conclusively.

Analyze the thing you have to do to get it.

Plan your work ahead.

Do one thing at a time.

Finish that one thing and send it on its way before starting the next.

Once started keep going.

We are paying too much attention to the little details in the supply department, and in doing so we are overlooking the factor which will make or break any organization. Is it business-like to spend hours figuring ways and means of piling bolts, and give no thought toward developing the man power and brains of the supply department? With competent men hand-picked and trained in a regular manner, the little things which may save time and costs will be taken care of as a matter of course. On the other hand, untrained and uninterested men can make no records nor save any money with the most modern methods and facilities. We must secure, train and keep man power above the average.

To build up a competent and trustworthy personnel a supply officer must be willing to devote considerable time and energy to the work, and through it all must maintain the patience of a Job and the enthusiasm of a cheer leader. The expenditure of efforts in this direction will be repaid many fold.

Consider a common axe handle. It does not grow in any forest ready for use, however suitable the timber may be. It must be shaped, turned, finished and finally fitted.

Thus, I have placed before you the greatest problem confronting the present supply department executives to study and solve in the interest of developing more and better men for the executive positions of the future who will be able to direct successfully the more and more complex activities of the supply department.

Advisory Boards to Meet

The following meetings have been definitely announced by the various shippers advisory boards throughout the country:

Pacific Northwest Board
June 9, 1927—Spokane, Wash.
New England Board
June 10, 1927—Manchester, N. H.
Southeast Board
June 10, 1927—Mobile, Ala.
Trans-Missouri-Kansas Board
June 15, 1927—Wichita, Kansas.
Pacific Coast Board
June 17, 1927—Los Angeles, Calif.
Ohio Valley Board
June 21, 1927—Indianapolis, Ind.
Central Western Board
June 23, 1927—Casper, Wyoming.
Allegheny Board
June 30, 1927—Youngstown, O.

Package Service to Mexico

As a result of the establishing of through rates and through bills of lading from points in the United States to points in the Republic of Mexico, in accordance with Southwestern Lines' Tariff No. 112-D, I. C. C. 1925, published by J. E. Johanson, effective May 20, arrangements have been made with the National Railways of Mexico for the operation of package cars from St. Louis as follows: In connection with the Missouri Pacific and I. & G. N., and in connection with the Cotton Belt, Southern Pacific and Texas Mexican, to the following points in the Republic of Mexico, via Laredo: Monterrey, Saltillo, San Luis Potosi, and Mexico City.

"It's the whys that help to make us wise."

Standardization Cuts Investment

Second Prize Winning Paper

By James M. Day

Foreman of Stores, Southern Pacific Co., Oakland

THE word Standardization is a very common one now among American business methods in discussions of all kinds. Unfortunately the word Standard has more than one accepted meaning and has a rather different meaning in modern management from that in which it is used in general discussion. In the latter case it refers usually to the definition of some article of produce by size, weight, etc., in order that it may always be exactly identified. The article may be tubing, wire, rail, motor car, or some small part manufactured to be fitted into a car or locomotive, and to say that it is "standard" means that the article can be obtained if an order is repeated, without troublesome adaptations being necessary. For instance a Class "A" railroad finds it has 25 makes of motor cars on its system, it prevails on the management to reduce the number to five or six. Again finding that ten sorts of locomotive smoke stacks were in use, it similarly reduces to three. The advantage of this reform, having specified sizes and makes always manufactured to be carried in store stock for protection of the equipment, is that it creates a small investment of capital, with easier interchangeability of small parts in different equipment with little or no inconvenience. and enables the stores department to have parts on hand at all times to meet immediate requirements. Experience has certainly shown that by the use of proper methods it is perfectly possible to keep up equipment or even improve a standard of quality when an article is adopted as standard and manufactured in much greater quantities.

Stocks Must Be Arranged So That Time Shall Not Be Lost Filling Orders

A standard article is an article which has been carefully considered with reference to its fitness to fulfill the varied needs of service, and for that reason has been adopted as the common means of satisfying those needs. A standard practice in modern storekeeping is simply a carefully thought out method of performing a function. The standard method of doing anything is simply the best method that can be devised at the time of adoption, and when practiced in this way makes a constant invitation to improvement. Every one should be doing the best work he can do in the best possible way or the "One Best Way."

A stores department can certainly proceed much more easily by standardization than by proceeding vaguely without a plan, and to arrive properly at a standard article or method. In the first place we must have the full cooperation and assistance of the officer or heads of the using departments. Satisfactory results can be obtained only through the whole-hearted support from the users, which can easily be obtained when they realize that all efforts are directed toward giving them service. They are the ones directly involved in arriving at or changing a standard and should see to it that this work be done by experts as competent to do it as were those who originally framed the standing standards adopted and practiced this way produce the best that is known at any one time.

After a standard article has been adopted by the using department and stores department notified, it can easily be lived up to through the medium of stores department standard practices of checking and providing for requisitions which responsibility falls on the section stockman who is trained to be an expert on handling the class of material assigned to him, and should see to it that no standard material be issued for any other purpose than what it was originally adopted for. Any deviation from a standard should be brought to the attention of the management in view of furnishing a standard article and cancelling special items discouraging varieties and avoiding obsolete and surplus material.

Two things are insisted upon in modern storekeeping, first standardization; second, the keeping of standard stock records in such a form that they constitute a perpetual inventory, an arrangement

Second paper chosen by a committee in the Purchases and Stores convention at Chicago.

by which the quantity of stock of each sort of material can be ascertained at a moment's notice, and the predetermination of the maximum and minimum quantity desired of each item. This is the program for efficient storekeeping and the foundation and fundamental principle by which most standard stock books are compiled.

The question of how to keep effective control over stores is one to which railroads have given much attention. If a railroad is counting its costs carefully, and at the same time trying to get work done more rapidly, it can not afford on one hand, to have capital stock locked up and space occupied by superabundant supplies, nor on the other hand, to have work delayed for lack of material. To cope with this situation most railroads of this country have adopted standard practices of ordering, receiving, storing, disbursing and accounting for material, which is controlled by the adoption of a "standard stock book" that guides the storekeeper in providing materials, not in abundance, but to meet the immediate requirements of the users at all times by basing orders on past performances or "monthly consumption."

On every steam engine there is a regulating device, a governor, that balances the supply of steam with the demand for power. When more power is needed, more steam is admitted. When the load decreases, the governor automatically lessens the amount of steam fed to the cylinder. In our stock books, the monthly consumption performs a similar function. It balances the amount of material to be ordered. When there is a great demand for materials the monthly consumption increases, and at the time of retrenchment it automatically decreases. Without it the stock book is out of balance in one direction or another, not enough material on hand, or too much material on hand.

A storekeeper aiming at a general good order and control, desires to store and keep a record of his material systematically, and in order to accomplish this we have our standard stock books and standard material racks for maintaining stock and records which lists material in sectional and alphabetical arrangement. It is the accomplishment of a carefully thought out method of listing and maintaining a complete stock and permanent record of receipts and disbursements of material which has been adopted by their respective roads as their standards.

In the past several years most railroad storekeepers have given much thought and consideration to standard practices which have resulted in the adoption of standards, office equipment for section stockmen, stock books and records, standard accounting forms, material racks, material trays, material tags, unit counting and pricing systems, supply trains, automobile trucks and trailers, reclamation practices, assembling material, caboose supply and many other practices too numerous to mention in this article, all of which promotes better and more efficient storekeeping; and has resulted on most railroads in having all material handled exclusively by stores department employes who watch for substantial savings in material handling expense by the development and adoption of standard methods and facilities, and the stores department can develop and use such improved methods and effect the savings thereby more readily than will other departments which handle material as a side issue and not as one of the primary duties. When material and supplies are handled by employes of other departments, the handling cost is never accurately known and therefore cannot be controlled. When store department employes handle all the material and supplies, by the present practice of modern railroad storekeeping, the cost of doing the work is readily known and can be regulated so that proper economy along these lines can be assured.

I have chosen this as a subject for the reason that this is the foundation principle on which most railroads base their system of storekeeping.

Standard Practices means order and arrangement.

You may begin to answer questions for yourself when you realize that railroads with 10,000 miles of track find it necessary to carry 40,000 or 80,000 items. Imagine the confusion and chaos that would result if we had no standard method of caring for this vast amount of material.

Suppose this material was merely dumped into a building or a place called a store and scattered here and there with no idea of orderly arrangement. Without the present standard store department practices we would revert to the days when the railroads had no stores department, to the days when every mechanic and roadmaster purchased and carried his own supplies, when it was the practice to keep material anywhere. The storeroom might be an unoccupied corner of an enginehouse or machine shop, or a few shelves loosely constructed in an out-of-the-way place where material would often become covered up and forgotten and new material purchased when enough was actually on hand to do the work.

After you have answered these questions and find the actual results obtained in the past few years from standard practices you will no doubt be anxious to know what the committee on Division VI of the American Railroad Association now has to offer along these lines to help in reduction of stock investments.

Utah cuts from her forests 37,500,000 board feet annually, divided as follows—20,000,000 feet of cordwood; 8,500,000 feet of mine props, posts and poles 9,000,000 feet of saw timber.

If You Wish to Know the Time

Accurate Watches Everywhere A Rule

By C. W. Geiger

One of the Commonest Sights in Everyday Train Operation

IF YOU wish to know the time ask a trainman; the correct railroad time ask a trainman. For every trainman that's in sight has a watch, and keeps it "right." If he doesn't he won't long remain a trainman.

This is only a parody on an old time jingle known among policemen all over America, "Every Copper on the Force," but it describes in a few words one of the cardinal rules of train operation. Pictures of conductors and engineers comparing watches have become as common as those of the fireman oiling 'round while the old man eats his dinner. Yet, it should be realized, next to power, nothing is so important in train operation as time—correct time. No trainman's watch is allowed to be "about right." It must be absolutely right, and so must all the watches on the division. "Five minutes for variations," is an accepted rule of safety, but any watch that really varied this much would be condemned instantly, provided it had been discovered before being ground to pieces in a wreck. No trainman pays any attention to ordinary clocks about town. Jewelers' chronometers have no attraction for him. He sets his watch and has it regulated at one certain, authorized place, and he keeps it that way.

Every employe in the train service of a railroad not only trainmen and enginemen, but also anyone connected with train movement such as superintendents, dispatchers, towermen, signalmen, must have watches that show no variation of more than ten seconds in any twenty-four hours, or of thirty seconds in two weeks. This rule varies a trifle, perhaps, on different roads, but on the average it is the standard practice.

An elaborate system of inspection is enforced whereby employes' watches are examined periodically to see they are up to standard, and to provide for adjustment and repairs when they show variations beyond the limits permitted by the rules.

Thirty-seven kinds of watches are allowed on the Southern Pacific, for example, all of them to contain at least seventeen jewels. Some are made with nineteen jewels and some with twenty-three.

Not less frequently than once every quarter watches are submitted to one of the regular company inspectors who tests them for temperatures ranging from thirty to ninety-five degrees, and for five positions. Twice a month every train service employe must have his watch compared with a standard regulator clock, and every fifteen months must leave it to be cleaned and oiled. When a watch is left with an inspector a standard "loaner" watch is provided that is guaranteed to maintain the required accuracy.

In order to enforce compliance with time service rules, the general time inspector has worked out a careful system for checking on every employe. When a man buys his watch it is examined carefully to see whether it meets the standard demanded. The facts concerning it, make, number of jewels, are entered on a certificate. At every inspection the employe presents his certificate for further entries as to the variations from absolute time and the means taken to adjust it. The certificate is taken up at the quarterly inspection, forwarded to the superintendent and a new one made out for the coming quarter. The employe carries the current card with him as evidence that he is living up to the rules, and the superintendent has the old card as a check on his record.

The Company's Inspector Checks Up Every Watch Regularly

Death Comes to H. E. Huntington

Work for Yourself, His Rule

By Charles Dillon

IF YOU want to make money own a business yourself. Don't stay on any man's pay roll any longer than necessary to get a start.

Save your money, no matter how little you have. Save something. If you can't do this you never will amount to much in business.

These two paragraphs sum up tersely the philosophy of life upon which rested the remarkable career of Henry E. Huntington who died, May 23, in Philadelphia. In a very definite way it was the philosophy of the late James J. Hill whose busy life resembled Mr. Huntington's in many ways. Both started their earning careers as clerks at very low wages; both saved their money; both went into business for themselves early in life, and both became outstanding internationally known men of their times in more than transportation.

In the minds of the uninformed it was quite generally supposed Mr. Huntington's great wealth came from his famous uncle, C. P. Huntington. But this was not wholly true. The fortune which Henry Huntington acquired was founded by himself through his own careful management and foresight, and was already well established when the great railroad giant of the Southern Pacific died in 1900 and left him thirty millions more. Without help from anyone, with only his own natural industry and thrift he rose from humble beginnings to a place in the world's esteem, not only in the field of transportation and other businesses but in the realms of art, education, and very liberal philanthropy.

Mr. Huntington was born in Oneonta, N. Y. February 27, 1850, the son of Solon and Harriet Saunders Huntington. There was no money in the family. The boy, it soon became apparent, would have to go to work early, as so many very successful men have had to do. At 17 he became a clerk in a hardware store in the town where he was born. While working there the owner fell ill and the boy was compelled, much against his own wishes, to take charge of the store. It is said that he ran the business for a month successfully. He kept this job for two years, saved a part of his small earnings, and then got another place in New York.

By this time he began to attract the attention of his uncle, Collis P. Huntington. The uncle already had made a name for himself as a railroad builder, one of those who participated in the linking of the Atlantic Coast with the Pacific by a railroad. "C. P.," as he was called, was part owner of a store in Sacramento, and as such he went to New York frequently to purchase goods and thus had an opportunity to see how his young nephew was getting along.

In 1874 Collis P. Huntington had acquired ownership of what came to be known as the Chesapeake & Ohio R. R., in Virginia. The state had been trying to complete the road across the Blue Ridge, but too many of the contractors had gone broke at the task.

Henry E. Huntington.

The elder Huntington soon figured out that the reason the contractors had been unsuccessful in their project was because they were being gouged for supplies. One of the big items was railroad ties. He bought a sawmill and offered his nephew the job of managing it.

The young man, still under 21, although admitting he knew nothing about managing a sawmill, took the job in hand and soon had the mill running so efficiently that the price of ties was cut from about $1 to 28 cents apiece.

When the uncle later sold the sawmill, he was surprised to learn that one of the purchasers was his own nephew, who had been managing the mill. And then young

Henry showed that he was a believer in a principle that guided him through the rest of his life: "If you want to make money, own a business yourself." It was not long before he was the sole owner of the sawmill, having borrowed the money to buy the business. In a few years he had paid the debt, principal and interest.

In 1880 he sold the mill, which he had built up into a successful business. The proceeds from the sale might be considered Mr. Huntington's first financial "nest egg."

The uncle had been pushing the construction of the Chesapeake, Ohio & Southern, but there was a stretch of about 65 miles down in Tennessee that was extremely slow work. It was not going right at all. The young nephew was again called in by the uncle and asked to take on a man-sized job. He accepted, and again showed unusual ability. The gap was completed in record time. It was Henry E. Huntington's first direct connection with the business of transportation which was to occupy him the greater part of his life.

As part of his plan to push his railroad system to New Orleans, there to tie in with the Southern Pacific westward, Collis P. Huntington had acquired the Kentucky Central R. R. It was in a generally dilapidated condition, physically and financially.

The nephew, with the title of vice president and general manager went to work. He asked the uncle if he was to be just a figurehead or a real manager. He was given a free hand. He put the road in shape physically, and, despite a receivership, which had followed the purchase of the line, carried it through its troubles and built its business up to a healthy volume.

In 1890 to 1892 he was vice president and general manager of the Elizabeth, Lexington & Big Sandy and the Ohio Valley railways.

It was in 1892 that Henry Huntington came west, moving to San Francisco, where he held the position of assistant to the president of the Southern Pacific, including at that time the Central Pacific. He was by this time really the personal representative on the Pacific Coast of his uncle, who kept his offices in New York.

Collis P. Huntington died in 1900. His nephew was the logical one to succeed him as head of the Southern Pacific. The uncle had left his estate to his widow and to his nephew. Henry Huntington suddenly found $30,000,000 at his fingers' ends, ready to do his bidding. He soon sold his interest in the Southern Pacific to E. H. Harriman and left the steam railroad business for good, taking up electric railroading in its place.

Mr. Huntington moved to Los Angeles when that city had 100,000 population. Street cars interested him mightily. After making a thorough study of the city's electric railway system, not a small part of his study being made while riding up and down the system at all hours of the day and night and conversing with the car crews, he bought a controlling interest in it. He caused a complete rejuvenation in the lines. His next move was to build and develop the Pacific Electric interurban system as part of the dream of a complete network of electric railways covering not only Los Angeles but the territory for miles around.

With the characteristic Huntington psychology, he felt that the greatest accomplishment could be brought about by one-man ownership and control. Consequently in 1910 he sold his interest in the Pacific Electric to the Southern Pacific but retained complete ownership of the Los Angeles Railway system. It is said that in order to carry out his policy of one-man ownership he virtually traded his half-ownership in one company for complete ownership in the other. A few years ago he disposed of his interest in the Chesapeake & Ohio, which left his railway holdings entirely in the local street car system.

His business interests carried him into many other fields. He was the chairman of the board of directors of the Newport News Shipbuilding and Dry Dock Co., the largest privately-owned business of its kind in existence. Four months ago Mr. Huntington was listed as a director in the City Railway Co. of Los Angeles, and vice president; Equitable Trust Company of New York, Hammond Lumber Co., Huntington Land and Improvement Co. also as president; Huntington-Redondo Co. also president; Los Angeles Railway Co., also president; Los Angeles Railway Corp., also president; the Naples Co.; Naples Extension Co., also president; National Surety Co.; Newport News Land Corp., also chairman of directors; Newport News Shipbuilding and Dry Dock Co., also as chairman of directors; Newport News and Mississippi Valley Co., San Gabriel Valley Water Co., also president; Southern California Edison Co.; Southern Pacific Co., Safety Insulated Wire and Cable Co., also chairman of directors; Oak Knoll Co., also president; Alhambra Addition Water Co; Huntington Beach Co.; Newport News Light and Water Co.; Old Dominion Land Co.; San Gabriel River Improvement Co.; Wells, Fargo & Co.

But Henry Huntington was known and loved for things quite apart from all these big industrial concerns. His beautiful home in San Marino was a veritable storehouse of the best in art and literature and the Huntington Library is declared to be the finest of its kind in the world—the contents, not the structure, although this is handsome. In the last few years the home has received many of the world's famous men and women. The library and art galley now go to the public to be controlled by a self-perpetuating board of trustees, under the terms of a deed executed several years ago, by Mr. Huntington. This foundation, known as the Henry

The Famous Huntington Library on the San Marino Estate.

E. Huntington Library and Art Gallery, which he gave to the people, includes his entire estate of 500 acres in San Marino. These grounds, beautifully landscaped and elaborately planted in a series of gardens containing many rare botanical specimens, are the site of the library and Mr. Huntington's residence, which now houses his paintings and also collections of antique bronzes, tapestries, ceramics and other art objects. A Grecian mausoleum in honor of the late Mrs. Huntington now is under construction on the premises.

In his art collection, Mr. Huntington specialized in English portraiture. His unparalleled collection contains the outstanding masterpieces of great Eighteenth Century artists such as Gainsborough, Reynolds, Romney, Lawrence and Raeburn. Probably the most famous importation from England is Gainsborough's "Blue Boy," which was purchased at a reputed price of $750,000.

In the collection are twelve Romneys, eight Gainsboroughs and nine Reynoldses. The pictures now hang on the walls of the Huntington residence, which is expected eventually to be converted into an art gallery.

Many celebrated paintings also are hung in the library building, which is situated about 100 yards from the residence. Among them are Gilbert Stuart's famous portrait of George Washington, Sir Thomas Lawrence's Major Andre, and others.

Started for Mr. Huntington's own enjoyment, the library is now maintained chiefly for the benefit of scholars who come from all parts of the world to study there. About two weeks ago the custom of admitting a limited number of the general public on Friday afternoons was established.

Mr. Huntington held a life membership in the American Museum of Natural History, American Asiatic Association, American Defense Society, American Red Cross, American Forestry Association, Bibliograph Society of America and Bibliograph Society of London. He was a member of Concordance Society, Southwest Museum, Pasadena Music and Arts Association, New York, Los Angeles, Pasadena and Newport News chambers of commerce, Los Angeles Realty Board, California Academy of Sciences, Horticultural Society of New York, Society of Colonial Wars, Sons of Revolution and other such organizations. His clubs included Union League, Metropolitan, City, Midday, Grolier, Army and Navy (life), Brook, Hobby, Oneonta, Northeast Society, California, Jonathan, Los Angeles Country, Gamut, University, Midwick Country, Pasadena Country, San Gabriel Country, Annandale Golf, Automobile Club of California, Bibliophile and others.

Educational institutions were particularly generous in showering honors upon Mr. Huntington for his outstanding efforts toward artistic and industrial development, his handsome library gift to the state of California being cited frequently as a cause of such honor. Among the many honorary degrees he received was that of LL.D.

The Huntington Family Home at San Marino, Mr. Huntington in the Foreground.

from the University of California; Doctor of Laws by Occidental College, Doctor of Laws by New York University, honorary membership in Phi Beta Kappa, collegiate scholarship society in which he was named councilor for the Southern California district.

Mr. Huntington was married twice. His first wife was Mary E. Prentice, whom he married in 1873. After her death he married in July, 1913, Mrs. Arabella D. Huntington, widow of his uncle, Collis P. Huntington. His second wife died in September, 1924. All of Henry Huntington's children were by his first wife. One of them, Howard Huntington, who lived in Pasadena, is dead.

The others are: Mrs. Clara H. Perkins of Rome, Italy; Mrs. John B. Metcalf of Piedmont, Cal., and Miss Marian Huntington of San Francisco. Mrs. Perkins has three children, Mrs. Metcalf, four, and Howard Huntington, whose widow is now Mrs. James R. Brehm of Pasadena, had six children. Henry Huntington's sister, Mrs. Edmund B. Holladay, resides in Pasadena. There are no other near relatives.

Mr. Huntington's will was offered for probate May 26 in Los Angeles. It disposes of a fortune of about a hundred million dollars. In addition to this it is estimated the great financier invested at least $75,000,000 in the Huntington Foundation. The will discloses the most generous provision for his immediate family, and this extends to grandchildren, nephews, nieces, cousins, and several religious and educational institutions. In conjunction with what he already had done for humanity, Mr. Huntington left $2,000,000 with a most capable board of trustees for building in Los Angeles and maintaining a memorial hospital to his son, the late Howard Huntington and distinguished uncle, Collis P. Huntington.

Almost all the bequests are in the form of long-time trusts which are not terminated until the death of the legatee, when provision is made for a final distribution to the heirs of the present inheritors.

Private Rooms on Day Trains

Beds with box springs and deep mattresses, one bed to the room —a private room where you may stay all day if you wish— is one of the chief attractions offered by the Chicago Milwaukee & St. Paul on its new Pioneer Limited. The new trains, ball bearings and everything, went into service between Chicago and the Pacific Coast May 21. Cars having private rooms, an innovation in equipment adopted by several roads recently, ordinarily are used only on night trains. The Milwaukee's new cars contain six single rooms so arranged that they may be used en suite if desired, an observation parlor and platform, and women's lounge. The private room car is likely to be the principal feature of the de luxe limited, although all the equipment is new and exceptionally handsome. In each room is a stationary bed 32 inches wide and 6 feet 5⅝ inches long with box spring and mattress. There are full toilet facilities, compactly arranged, the washstand and hopper having the appearance of an upholstered chair. When the back is folded down the washstand can be used, with hot and cold water as usual, and there is also a dental faucet. A thermos bottle and glass are in a holder at one side. There is a mirror and glass shelf above the washstand, and a long mirror on the side of each entrance door. There is a small folding table, attached to the wall opposite the bed. The floor is covered with marbleized rubber tiling in black and cream squares, with a specially designed rug similar to the other carpets, at the bedside. At the head of the bed is a shoebox with a door in the corridor wall so the porter can remove and replace shoes without disturbing the passenger. There is a rack for towels and an especially designed waste basket. Ample baggage space is provided under the bed and in racks.

Another attractive departure announced by the Milwaukee is electrical refrigeration for dining cars so that the bothersome reicing labor and delay has been wiped out.

S. P. Protests Valuation

The report of the Interstate Commerce Commission setting the valuation of the Southern Pacific on June 30, 1926, at $477,439,910 will be declined and protest will be filed to present claims for higher values, it has been announced by H. W. De Forest, chairman of the executive committee in New York.

The valuation does not purport to be a complete valuation of the transportation property, it was said, covering only property directly owned by the Southern Pacific and that directly operated under lease.

Properties controlled by stock ownership in Texas, Louisiana and Arizona are valued separately, as well as lines acquired since June 30, 1926, such as the El Paso & Southwestern system, which includes four companies.

Affiliated firms and large investments in facilities are not included, nor are betterments and additions worth $350,000,000, which were made since June 30, 1926. Noncarrier land and structures also are not included in the rate fixing estimate, it was said.

The appraisal is based on replacement prices in 1914 and unfair depreciation estimates, it was said.

Make yourself worth more by learning to handle your work better. Read everything you can get hold of that will keep you up-to-date in your business. Never be satisfied with what you know. Learn more and you will earn more.

Freight Service By Electric Lines

Making Up Passenger Losses

By T. H. Stoffel

THE handling of freight and express has proved a very valuable and profitable source of revenue for electric interurban railways. In many instances it has saved the investments in such properties from becoming a total loss.

With the coming of the motor driven rubber tired vehicle revenues began to fall off as the increasing use of the privately owned automobile gained in popularity. The situation has been further aggravated by the greatly increased costs of labor, material and operation during the last ten years, and consequently the majority of these electric lines found it almost impossible to pay operating expenses, even with much deferred maintenance and upkeep, resulting in greatly depreciated physical value.

It became evident the automobile had come to stay, and that there was little possibility of being able to induce the short haul rider to return to the use of the electric railway, regardless of the kind of service offered; also that something would have to be done to conserve these properties and the investments they represented. On the other hand it was apparent that notwithstanding the extensive use of the automotive vehicle, there was still a considerable demand for electric railway service; complete abandonment of which would in many cases result in hardship to at least a part of the population served, and in some instances leave entire communities without public transportation facilities of any kind.

With those facts in mind, a complete survey and thorough study was made of the situation, to ascertain what, if anything, could be done to add to the earning power of these lines, and at the same time, accomplish this without great expense or new capital investment, for which money was not available.

This study developed that existing facilities, such as roadway, track, power generating, converting and distributing plants, were idle a large part of the time, especially at night, and therefore greater use could be made of these facilities without adding to investment, and at the same time increase load factors and earning capacity. It was also found there was a real need, so far as the public was concerned, for an expeditious and reliable freight and express transportation service, which could be operated at off peak hours and at night. Executive and supervisory organization already existed, and therefore all that would be necessary to establish freight service was to provide motive pow-

Freight Cars From the Pacific Electric on the Ocean Front.

—Paper presented before the Canadian Electric Railway Association, Winnipeg, Canada, May 31-June 3. Mr. Stoffel represents the Westinghouse Electric & Mfg. Co.

er and other rolling stock, and terminal or station facilities, with a properly manned freight traffic organization.

As a result of recommendations, a number of electric railways undertook the handling of package, or less than carload freight, using equipment rebuilt from discarded passenger cars and motors. Terminal and station facilities were improvised by using any vacant and accessible building space available. The service proved so satisfactory from the start that there has been an insistent demand on the part of the shipping public ever since, for enlarged facilities and extension of the territory covered. At present practically all electric interurban railways in the United States, even those which might be termed isolated lines, are handling freight or express to some extent at least.

At first this freight service was necessarily confined to local destinations, but as the demands increased and equipment could be provided, the service was extended to cover destinations on connecting lines, until today for example, the group of electric railways operating approximately 5,000 route miles of line in Ohio, Indiana and Michigan, handle shipments on through rates and billing for destinations up to 400 miles distant, and provide through merchandise car service between terminals from 200 to 300 miles apart; traveling over six or seven lines in some instances.

The service is exceptional, and cannot as a matter of fact, be duplicated by any other means of transportation. Next morning delivery is made to consignees 150 to 200 miles from shipping point, and proportionately fast time is made for greater distances. This group of lines gradually has increased equipment and facilities, until they now have in service about 400 motor box cars, 20 locomotives, 1,500 trail box cars, 200 stock cars and 900 open top trail cars.

Terminal facilities at important distributing centers also have been greatly improved or rebuilt. Notable among these is the new million dollar freight terminal used jointly by the four electric railways centering at Indianapolis. This terminal consists of two warehouses; one 918 ft. long and the other 450 ft. long, with house track capacity for approximately 100 cars at a single setting, team track capacity for an additional 50 cars, and storage tracks to accommodate about 60 cars more. An average of over 125 cars is handled through this terminal daily.

Similar facilities have been provided at Detroit, handling about 130 cars a day, Cleveland, Toledo, Columbus, Akron, Dayton, and while most of them are now becoming congested, plans are in the making for extensions and improvements. The latest new terminal is that recently opened at Ft. Wayne, Ind. at a cost of about half a million dollars. This terminal is modern in every respect, of fireproof construction, and has all the latest approved facilities for efficient and economical handling of freight; in fact it is far in advance of many steam road terminals in much lager cities.

The freight business in this territory has grown to such an extent that a number of lines are planning on building around towns on private right of way, to get away from sharp curves and street congestion, and to make possible the handling of longer trains, and expedite movement. Some revision of track along these already has been completed. Notwithstanding the many physical handicaps, however, trains of from eight to 15 cars are not unusual, and in some instances roads are busier hauling freight between 6:00 p. m. and 6:00 a. m. than they are handling passengers during the day time.

The handling of freight or express must necessarily be profitable, to warrant the large investment of new capital and additions which have been and will be made to keep pace with the demand for this service. While much progress has been made by the group of lines mentioned in developing freight business as a source of revenue, possibilities of further increasing the business are practically unlimited. The tonnage now handled consists almost entirely of merchandise or package freight, and lines concerned have found it difficult to provide equipment and other facilities to keep up with demands. Except in a few instances, little has been done to develop the highly desirable straight carload business, of which there is an enormous tonnage available. To handle this latter class of business, it is of course necessary to provide team track sidings for loading and unloading, construct sidings into industries adjacent to the line, as well as add to motive power and rolling stock.

The success of the undertaking depends largely upon a traffic department, not only in securing and taking proper care of visible or existing tonnage, but also in developing new business. For example, mention is made of an electric line over 100 miles long serving a large terminal at each end; the territory between being strictly devoted to grain farming on very poor soil for that crop. The traffic manager of the railway secured samples of the ground for a distance of about 25 miles along the line, and had it analyzed, and it was found to be especially suitable for the growing of tomatoes and pumpkins. The farmers were induced to try these crops and the results were so successful, that the railway was able to prevail upon a large canning concern to put up a plant along the line. After several years expansion of this industry, there are now three canning factories in the district, the railway is handling from 600 to 800 cars annually in and out of these plants, the farmers are becoming prosperous and derive income, not only from the growing of tomatoes and pumpkins, but their tomato plants have gained such an enviable reputation, that many millions are sold and shipped to other districts every

spring. This added prosperity of the farmer is further reflected in the revenues of the railway in other directions.

In some localities the railways have purchased competing bus lines and are operating them in an attempt to reduce their losses. Notwithstanding this, the net result of passenger operation frequently shows an actual loss, with an average passenger operating ratio of from 90 to 96 per cent. On the other hand, net results from freight operation indicate an operating ratio of from 65 to 85 per cent, or a net profit from operation of from 15 to 35 per cent, depending on the length of line, volume and class of tonnage available, and extent of territory to be covered. In arriving at these figures covering freight operating ratios, it should be explained that this branch of service bears its full share, usually on a car mile basis, of the cost of maintaining all facilities used jointly with the passenger service, such as way, structures and equipment, power and its distribution, conducting transportation, traffic and other general and miscellaneous expenses, in addition to all amounts entirely and directly chargeable to freight operations, such as train and station labor, loss and damage, etc. Rates charged for freight transportation are practically on the same basis as those of steam railroads in the same territory.

Generally speaking revenue now derived from freight operation by electric lines making a real effort to develop this branch of service, amounts to approximately 30 to 40 per cent of the gross. On a number of lines it has reached 50 to 60 per cent, and on one or two lines it is as much as 70 per cent. It is believed that with full development, freight revenue will eventually average at least 75 per cent on most properties. To reach this condition, it will, of course, be necessary to spend considerable new money for motive power, rolling stock, terminal facilities, constructing track on private way around congested districts, extension of meeting and passing tracks, etc.

With proper facilities and equipment little difficulty is experienced in securing the necessary joint rates and traffic arrangements with steam lines, in fact some of the latter are welcoming the cooperation of electric railways, and have established through traffic arrangements on merchandise, even where dray transfer at junction points is necessary. Arrangements of this kind are of equal advantage to both the electric and steam lines, opening up new markets and territories to all of them, which could not be reached otherwise, thereby increasing revenue tonnage.

Steam line data indicate that a loss usually results from the transportation of merchandise tonnage for distances less than 80 to 100 miles, due to the much greater overhead, more expensive operation and maintenance of the larger terminals necessary, heavier roadbed, rolling stock, etc. Therefore, where electric lines parallel steam lines and are able to take care of the merchandise from distributing centers, the steam roads are benefited because less warehouse capacity is taken up with unremunerative business, cars are released for more important service, and capacity of main line tracks is increased for the movement of the more profitable long haul business.

A number of electric lines have established a very profitable station to station express service, handling packages in the baggage compartment of passenger cars at rates of from one and a half to two times the first class freight rate. Revenue derived from this tonnage is credited to passenger operation.

Management Wins

I can best illustrate the place that management has assumed in our industrial machine by comparing modern industry to an automobile. Capital supplies the gas without which the engine cannot run. Labor is the engine, without which the gas is useless. And Management is the chauffeur at the wheel, coordinating the engine and the gas and steering the machine, thus driven, in the way that it should go.—Lewis E. Pierson, Chairman, American Exchange Irving Trust Company, New York.

The Changes of 50 Years

"Mike" Lynch.

Thirteen cars was a full load for one freight engine up El Casco canyon grade when Michael Lynch began railroading for the Southern Pacific. "And now look at the trains, look at the engines," Mike exclaimed, a few days ago, retiring after 51 years in the service. "Look at the things they're doing nowdays, will you! 'Tis a queer world we're living in, and a fast one. I'm glad to rest."

Mike Lynch has been guarding a crossing at Highgrove near Riverside for ten years, trying to keep a speed-mad world from bumping into Southern Pacific trains, but he had much different work, although no more important, when the company was young. For more than half a century he has been in the service, starting in November, 1875, with a construction crew extending the track eastward from Los Angeles to Spadra, through Arizona, New Mexico and Texas, under the supervision of J. H. Strowbridge. As a reward for faithful service Lynch retires on the customary pension.

A new double decked superplane has been tested in Germany with a cabin spacious enough for twenty beds, as well as for heavy luggage.

Greater Utilization of Equipment

INCREASED utilization of freight cars, locomotives and other railway equipment is necessary if the carriers are to continue to meet the constantly growing volume of freight traffic resulting from the natural development of American industry, L. K. Sillcox, of Chicago, general superintendent of motive power for the Chicago, Milwaukee & St. Paul Railway, told the annual meeting of the American Society of Mechanical Engineers held in New York Mr. Silcox is chairman of the mechanical section of the American Railway Association.

"To assist in bringing about a maximum use of freight cars," said he, "improvements must be made in the arrangement of freight terminals, particularly freight yards where cars are being assembled into trains. Improvement can further be attained by developing a proper supply of cars and locomotives needed.

"There is now a movement toward increasing the utilization of locomotives, particularly by increasing the length of runs so as to reduce the number actually in service and increase the number of miles covered by each locomotive per day.

"There is a necessity for further expediting the movement of freight, not only to reduce the cost of handling but to reduce the time from initial to final destination for freight shipments and assist the present trend of merchandising small stocks by means of rapid delivery.

"The average load per car has not increased in the past five years, but the loading of a freight car more nearly to capacity is a matter which is nearly, but not entirely, beyond the control of a carrier. It is of vital importance that there be an increase in the average load carried per car and that there be an increase in the speed with which cars are handled by the railroads if the rail carriers are to continue to provide adequate transportation in the face of the constantly increasing industrial development of this nation. If for no other reason this is necessary from an economical standpoint.

Consolidations by Compulsion

THE league has always opposed measures intended to bring about consolidations by legal compulsion. It believes that the railroads should be left free to work out unifications, in their own way subject to the regulatory powers of the Interstate Commerce Commission and to sole legal restriction that such consolidations shall not unduly restrict competition of carriers.

The railroads are in a public business and these realignments should be permitted wherever they are in the public interest. We have always opposed the provision for a plan of consolidations to be promulgated by any governmental authority and have felt that such movements should be initiated by the carriers themselves.

—R. C. FULBRIGHT, Chairman, Legislative Committee, National Industrial Traffic League.

"Investment in equipment is a heavy burden since carriers must make suitable charges for depreciation in order to take care of the cost of equipment during its life. Consideration has to be given by the carriers to the interest on the investment in order to cover the cars themselves as well as the cost for carrying the investment in facilities for maintaining those cars. The cost per day per car, it is estimated, to cover such features is at least one dollar. Therefore a carrier owning 100,000 cars has a burden of $100,000 a day.

"It would seem that the number of freight cars now in use is sufficient to handle an increase in business, provided there is an increase in the utilization of cars. However, there are many older and lighter cars still in existence of a design not fitted for heavy train movement and this means that there must be continued a proper rate of retirement of old and acquisition of new cars.

"Statistics show that the average train tonnage has increased more rapidly than the average train speed. Improvements are necessary to permit trains to operate with a minimum number of stops so as to reduce considerably the running time between terminals. Train tonnage cannot be increased materially without larger power, but train speed can be increased by having reliable cars, locomotives and roadway facilities."

There are 213,000 cities, towns and villages in the United States. Yet 70 per cent of the nation's business is concentrated in 657 of them, or 0.3 per cent of the total; 80 per cent of all business is done in 2787 urban places of 2500 population and over—1.3 per cent of the total number of places. These urban places which occupy but 1 per cent of the land area of the country contain 51.4 per cent of the people, 88.6 per cent of bank deposits, 78.2 per cent of income tax returns, and 80.0 per cent of retail outlets.

Editorial Comment

The Editorial of This Edition

Bearing the weight of the harvest,
  Traveling night and day,
Linking the states together,
  Plodding along the way;
On to the distant cities,
  The ponderous freights go by,
Afar to the inland waters,
  Away to the mountains high.

Toiling along without ceasing,
  Beating through storms and rains,
Serving the world as workers,
  On go the heavy trains.
It is these that carry the burdens
  From valley and mountain side,
Taking the wealth of a nation
  Down to the ships at the tide.

And the passengers, riding in comfort
  Close by the window panes,
Reading their books and magazines,
  Safe from the storms and rains,
Never begin to realize the work
  Of the freights, far and nigh,
And scarcely look up from their reading
  As the ponderous freights roar by.

But the freights aren't looking for praises,
  Praise you can buy and sell;
Work is their well-worn watchword,
  Toil is the tale they tell.
Humanity needs their service, too,
  So the freights will go laboring on,
Serving the world as workers
  Till the work of the world is done.

—*The Tides of Commerce.*

IN AN after dinner talk one evening, not long ago, a fairly well known traveler who has lived up to the present on the fortune his grandfather created, deplored the growing materialism of the times in America. Romance, he said, had disappeared in the chase for dollars. The glory of the pioneers had been forgotten.

Newspaper men call this a bromide. It is the kind of talk one hears rather frequently in Europe. What would Charles Schwab have said if he had been at that dinner, or John Muir, Burroughs, Burbank, Edison, Westinghouse? How do men get this way? What is such a person's mental condition, or isn't it a matter of digestion? How can any man of intelligence read the history of this wonderful world, but particularly the record of its industrial development, and say romance is dead? How can any observing person have missed the outstanding trait dominant among America's great doers, the pride of achievement; and if this pride isn't the essence of romance, the marvelously interesting and colorful romance of business, what under the sun is it?

Did you ever meet a man connected with a large industry, a man who was producing something which he believed contributed to the general all round well-being of humanity, who wasn't proud to be so identified, who didn't believe his product was just about the best in its line? If you have, then the man you met wasn't well physically or mentally. They simply don't exist in this country; and just now we are considering what Secretary Kellogg would call a purely domestic question.

Romance is dead? Don't you believe it. And don't be afraid to recognize it in your work. It makes life and labor worth while. The pioneers referred to by the dyspeptic gentleman at the dinner were the valorous advance agents of a mighty host of progress. They may not have used the word in those days or thought of it, but the things they did, the daring achievements, the blazing of trails, the finding of mountain passes, the struggles in the wilderness, the hazards and the hardships of those pioneers built up for us the background of the most wonderful romance the world has ever known. And it lives today in the books, and in the hearts of the race.

Thirty-five years ago a railroad man, in an extemporaneous speech before a body of distinguished public men said, "I have deemed myself fortunate that my lines in life have been cast alongside the lines of steel which are the highways of civilization, that mighty network ever drawing closer and closer round the world, and emblematic of that great cloak of humanity which shall at some time gather within its folds all the people of the earth. But the men—the forces back of all this—the minds of skill and daring, of patient energy and endurance, who have wrought such work, and who are still solving by slow but sure methods those great problems, hastened a thousand years by the great inventions of the Nineteenth Century—to know and to be known among them, to be a co-worker with them in this great work—this is indeed to find life a worthy thing."

Romance is dead! Think of the limited trains rushing across this continent today! Think of the air mail, 30 hours from coast to coast! Think of planes carrying 20 passengers and a crew through the air across Europe in luxurious cabins with dining service and sleeping quarters! Think of the 22 million motor vehicles in this country, passenger service almost everywhere, and here, too, with dining facilities en route. Think of these things, you who imagine this is a prosaic world, and remember we talk to London across the sea nowdays, without wires; we are printing on the Pacific Coast this evening photographs of events that happened this morn-

ing in New York; sending endorsed checks by wireless. And if these things aren't enough to convince you that men labor to win, to achieve, to be the first, to live the really great romance, then think of Nungesser and Coli. Do you suppose these two Frenchmen were thinking of a $25,000 prize when they flew away into the unknown, or did they want, above everything else to gain the crown for France? Think of Charles Lindbergh, flying across this continent and over the Atlantic to Paris, alone. Can't you see him in the months he spent going from man to man, city to city, pleading for financial backing—a youngster of 25, never out of his native land, smiling his way into the hearts of men with money—the building of the plane—the flight to St. Louis, to New York, to Paris and fame and fortune and adulation enough to turn the head of an old timer but not of this modest, well-behaved young gentleman out of the Far West. Think of Chamberlin—Levine!

The man who doesn't see romance in this, entirely free from the material reward, is a dummy. His heart may beat but it is dead to all the noble impulses by which hearts are supposed to be influenced. Such a man should read "The Building of the Mighty Bridge," McMaster's old romantic novel. He should be compelled to learn, letter perfect, every line in Colonel Fuller's little book, "Pegasus, or the Problems of Transportation."

Romance is dead? There may be no swashbucklers now as in the days of the Three Musketeers, but we have our knights just the same. Now, as in the long ago, engineers are faring forth, ahead of every other force, to mark the way for progress. No swamp, no bottomless lake, no mountain can stop them. They wear no shining armor, these heralds of advancement, and they are too tired at night to care a whoop about romance, but it is there smiling, just the same. And when the line is through, and the road and the bridges are built, and no one has deviated by so much as the thirty-second part of an inch from the chosen way; when trains are rushing along, passengers peering out from their upholstered ease at the flying scene, believing, knowing the road is safe; when the villagers stir in their sleep and say, "She's a few minutes late tonight,"—can't you see how everything, all the work and the planning and achieving fit into a great romance?

Can anyone look, unimpressed, at the modern locomotive, the big three-cylinder power plants on wheels, the A-1, and the other radical types developed in recent years? Can any seeing, understanding mortal fail to feel a thrill in the presence of such marvels or give no thought to the brains that brought them forth, the long days and nights—years, sometimes—of patient thinking, planning, figuring, estimating? The finished product is a wonderful thing when the public sees it, but what about the chap who spent his life's best hours designing it, saw it grow into actuality, and then knew, as no one else ever could know, the exquisite agony of mind in the final hour when everyone lived just one supreme question: "Will it run?" No one ever is quite sure, you know, what may happen—and then the joy, the satisfaction in seeing a dream come true! What do you call this—commercialism or romance?

This pessimist who talked at the dinner—we wish the late Herbert Quick might speak to him. "Blessed be the tie that binds," said Quick, one day, quoting the old hymn. "The tie that binds this country together in national unity is the railroad tie."

Every passenger train, every freight, "Bearing the weight of the harvest," every mechanic and manufacturer of the things that add to the joy of living, all are parts in a great industrial, romantic, world drama. When we hear a man deplore our national materialism we think how expressive, after all, is some of the present day jargon of our much-maligned rising generation. Applesauce is a fine word.

Just a Suggestion

Employes of the General Electric Co., were paid for 4,405 suggestions last year. In all they made 13,703 suggestions. Pretty high average. Active employes, studying their jobs. Looking ahead.

Self-Interest Imperative

Charles Steinway, founder of the great piano business bearing his name, once said he had no artificial plan to offer for making men producers. "You must lead them through their self-interest," he said. "It is this alone that will keep them keyed up to the full capacity of their productiveness."

The Public Pays

"In the end the public must pay; the load can not be forever shifted to the railroads' shoulders," says the Drumright, Okla., News, discussing the growing tax burden imposed upon steam railroads.

Not for one moment can the load be shifted to the railroads. Always the public pays. Either in higher rates or impaired service the public pays—always.

The Fuel Convention

The members of the International Fuel Association listened to several exceptionally important papers and discussions in the Chicago convention last month. Notable among these was the thoughtful contribution of Dr. George Otis Smith, director of the U. S. Geological Survey who discussed the tremendous challenge American railroad men have faced and still are facing not only in cutting down distances but in reducing also the cost of covering the remaining miles with adequate transportation.

Fuel supervisors, and under them the men actually handling fuel, whether coal or oil, have a mighty responsibility in this great work, and the records of 1926 prove they have been equal to the demands made upon them.

They Knew Him When——

We have spent many hours in Little Falls, Minn., the boyhood home of Lindbergh, the air hero. Most of the time was used in looking for something fit to eat. We never heard of Lindbergh until he appeared at San Diego ready to fly to New York. Not a dozen persons in Little Falls could remember the name until the young man was flying over the Atlantic. Then lagging memories began to revive. The postoffice and grocery store philosophers suddenly recalled the bashful youth. When Lindbergh landed in Paris these village wise-acres "always knew he'd do it." It was "just like Charlie." And from now on the young man will begin to discover what a whale of a lot of friends and relations he has on his hands. All poor, too.

Long Engine Runs

Long runs by locomotives have become such an established element in operating practice looking toward economy that considerable interest will be found in the address before the International Fuel convention in Chicago last month by T. H. Williams, assistant general manager of the Southern Pacific. In this connection it will be interesting also to note what is being done in this respect by Australian railroads. The April number of the Victorian Railways magazine contains this editorial paragraph:

"As far as they have gone, the long engine run experiments between Melbourne and Serviceton, with an average of 400 tons of interstate freight, have been successful. The Mikado engine has stood up to the job well, and everybody, including District Rolling Stock Superintendent E. Jackson, who initiated the trials, late in February, seems to be satisfied. It is no small feat for a locomotive to do a trip of 600 miles or so, including shunting, without developing a fault. But the problem of hauling freight expeditiously to the border is fraught with other transport considerations, particularly variation in load, which, we understand will have to be threshed out very thoroughly before experiment can become established practice."

Never Too Late to Learn

Admitting without argument the general all round excellence of American dining car service, there still are a few things the managers may learn. For one thing the cars should carry foods to fit the kitchen. If the train is leaving a seaport obviously it should stock up lightly on seafood. Travelers usually will be fed up on that article and will be clamoring for meat, the redder the better.

Moving things forward from the back card to the front sometimes is dangerous practice. To put chops on the front card is likely to swamp the chef as most stewards ought to know.

If the car is covering a very long run—and many of these runs are altogether too long—consideration should be given, and very often is not, to changes of climate. What a man will eat ravenously in eastern Texas he won't touch several states farther on.

More thought should be given to the physical limitations of the crew with respect to climate. How some of them ever stand the strain month after month is a deep mystery, and many do not.

It would be a fine idea, too, to copy the system used on the Congressional Limited between Washington and New York. On that train, certainly as heavily patronized as any train in the country, every passenger receives a seat check and has a definite time at which to eat, and when that time arrives he eats. Standing in an aisle for an hour waiting for a chance to get dinner is an intolerable imposition on passengers' good temper.

The Seasonal Friend

"There is one kind of friend for whom I have no time," said a business man one day recently. "This is the seasonal friend. I am thinking now of freight solicitors representing what we call foreign lines, that is to say, roads not entering the city or state. Throughout most of the year these seasonal friends pay no attention to us. They never take the time to call, and inquire about our business. They never ask us whether we, who are paying the bills, have any complaint, or some unadjusted claim, or some little grievance actual or fancied, the wiping out of which might be very important for their lines. The only time we see these gentlemen is when the fruit crop has to be moved. Then the outer office is deluged. I wonder when these chaps will learn that a little personal, human interest in their patrons' business would go a long way toward getting business for the roads they represent?"

This May Mean You

Isn't it possible that some railroad executives overwork the idea that their first duty is to the stockholders? Isn't it likely that this kind of executive overlooks the fact, too, that some of the lesser lights in the organization are moved by the same impulse, to make a good showing to the men who own the road, and that their decisions, often at variance with the executive's, are influenced by this loyal ambition? If this isn't perfectly clear at first reading perhaps it would be better to inquire whether some executives fail to realize they are killing personal initiative, in the engineering departments for example, by overriding decisions based on scientific skill and experience?

Isn't it cheaper in the long run, isn't it real economy—even if you have to use your credit for part of the cost—to buy one good suit for $60 or $75 than to get two shoddy handmedowns for $25?

Won't this rule apply pretty frequently in all the affairs of life? Don't some executives injure their fingers occasionally in pinching pennies?

When an engineer's judgment is over-ridden; when purchases of equipment, based on first cost rather than upon ultimate results, are made for him; when materials are bought which, to his mind, are not the best to be had for his work, surely he should not be held accountable for results. Standardization has its virtues, but also it has liabilities.

The chief engineer's obligation to the stockholders is just as great as that of the president. If this obligation is his and he is being employed because of his training, experience and knowledge, and is being held accountable for the results in his department, surely his judgment should prevail in selecting material, equipment and men.

If you ever go to church and stay awake, you must have noticed that occasionally the minister passes out a few crisp remarks on personal morals. Having a liking for his job he never mentions names, but some body in the congregation wonders whether he means him. The sermon always hits some one. Some times it has a good effect. Once in a while some weak mortal mends his ways.

The Electric Railways

The people of this country will have to give more sympathetic consideration to our electric railways than they have been giving in the past. Due to competition this industry is very largely "in the red" and still, like the steam railways, it continues to give excellent service everywhere. The electric railways, again like steam railways, are confronted this year, as they are every year, by hostile and fool laws proposed in legislatures mostly western. California presents a glaring example of this unwise attitude. Railways, steam or electric, cannot quit business when it ceases to pay a fair return. Owners are compelled to sink more money, like gamblers, in the hope that eventually they may win. There is the hope, which springs eternal in the breasts of stockholders that the scales some day may be balanced in their favor. When will the people give intelligent attention to what their elected representatives are doing in legislatures, and for that matter, in congress?

Flying in A. D. 2000

If you wish to know the news of aviation read the advertisements. After you have done this get a copy of Kipling's Actions and Reactions, and read his fantastic story "With the Night Mail." This tale was written so long ago it seems almost in a class with Jules Verne, and other writings now called prophetic.

Kipling's classified column taken, with the story, from an imaginary air travel magazine of 2000 A. D., and the advertising of the same kind in Western Flying for May, 1927, makes a reader wonder which is genuine. Truly the news is in the ads. Here are two advertisements:

For sale—A Bargain—Single plane, narrow gauge vans, Pinke motor. Restayed this autumn. Hansen air-kit, 38-inch chest, 15½ collar. Can be seen by appointment. N. 2650.

For sale—One OX5 Jennie, Springfield job; D.H. wheels; square cell radiator; perfect condition; used only eight hours—$800. Bill Hunt, etc.

The first copy was written by Kipling a good many years ago; the second piece was printed last month. Kipling was writing for a laugh. Bill Hunt had something to sell. Kipling's contribution, representing what he fancied might be published in the year 2000, seems far-fetched enough, but is it any more remarkable than the usual developments heralded to the complacent world by the modern air magazine of May, 1927?

Kipling's story "With the Night Mail," and the "ads" he wrote to give it color, indicate his belief, amounting to prophecy, that flying in 2000 A.D. will be done almost exclusively in dirigibles.

One of Kipling's humorous display advertisements in this fanciful magazine described an appliance guaranteed to prevent planes from pitching. "What the skid was to our forefathers on the ground," says this ad, "pitch is to their sons in the air. ****Collison's forward-socketed Air Van renders it impossible for any plane to pitch."

Not long ago an American aviator announced at San Diego he had invented a method of construction or weight placement guaranteed to prevent a plane's pitching into a tail spin.

Let's Get Together

There have been some definite expressions of a sentiment approving the idea that all the instrumentalities of commerce whether moving by water, railroad or motor truck, should be coordinated into a national transportation system. Put in this language it sounds like government ownership. If this is the idea we are against it.

Viewed in a broader sense we now have a national system of transportation which includes about every form of vehicle, but it cannot be said to be scientifically coordinated upon any plan or theory of relative value based upon the ability of the different forms of transportation to serve the nation efficiently.

Just why is coordinated transportation a measure of economy, and why is it necessary?

Economy is possible provided there is sufficient commerce to warrant the maintenance of the present plant and equipment. If the equipment is greater than the commerce demands, economy is sacrificed. If the equipment is insufficient, huge losses occur because of the inability of producers to reach desirable markets with their goods.

Many and varying factors are to be considered in any appraisal of the relative adequacy of our present transportation scheme. Among these are the handl-

ing of perishable freight promptly; the deferring of non-perishable articles; the flow of fuel and raw materials for manufacture; the service to the farmer which will adjust itself to market conditions; the relative time required by the different forms of transportation, and a correct appraisal of time values as they are reflected in transportation.

These are but a few; many others will spring into view even before these are fully determined. The coordination of transportation would tend to promote economy in the arrangement of these means of transportation by adjusting the equipment used to the actual requirements of commerce. The competition which now exists does not produce this result. At times there is a large surplus of freight cars, and at others a conspicuous shortage. Even in times of car shortages no particular use is made of the water facilities which, if they were comparably useful, would find ready employment.

The entrance of the motor truck into the field of transportation puts a new phase on the situation. It seems reasonable to talk of the coordination of rail and water transportation, but the motor truck appears to have limitations as to handling long haul or heavy freight traffic.

About 90 per cent of all the trucks in use have a capacity of one and one-half tons or less. These are largely used for merchants' delivery, mechanics' trucks, and other miscellaneous forms of local stevedore delivery connected with retail merchant or manufacturing service which has no relation to commerce. The remainder have an aggregate capacity of approximately a quarter million tons.

The aggregate capacity of freight cars increased in 1924 over 1923 by 2,800,000 tons or ten times as much as the entire carrying capacity of all trucks available for commerce. The aggregate capacity of all freight carrying cars is approximately 110 million tons. The commercial trucks have, therefore, about one fourth of one per cent of the carrying capacity of all freight cars, and a good share of these commercial trucks are now owned by the railroads and express companies, and are being coordinated to their proper place in the transportation scheme.

The motor truck has a place in the national transportation system, and that place plainly is in terminal service, supplementing the railroad service and not competing with it.

What we need most is coordinated regulation of transportation provided we are to have regulation at all. If there is any one thing that railroad regulation ought to do it is to remove "unfair competition" either from water transportation or from motor trucks, and then by a process of conservation promote the welfare of all three forms by confining their activities to the field in which each can best serve the commerce of the nation. Such a policy unquestionably would be of great benefit to the railroads, and to the general public welfare.

No nation can prosper at the expense of its transportation instrumentalities. What we need is transportation coordinated on a plan of conservation, and the first step in that direction is to secure coordinated regulation.

The railroads have been compelled frequently to appeal to the courts for protection, and the court decisions are an everlasting rebuke to the present status of regulation. Coordinated regulation on a plan of conservatism is the greatest need today.

First Cost Isn't All

There are many fine companies in this country which have done much to advance the science of railroading. Their engineering staffs and their officers have spent years in research and study to develop the best, the most finished devices and material. Of course, this has taken considerable money. Proudly these men stand behind their products, realizing they have done everything possible to make theirs the finest, most servicable and best. Frankly and freely they give this knowledge and study to the railroads in the advancement of the industry, often quite regardless of monetary reward. But frequently they must ask themselves, has it been worth while?

We have in mind a striking example of this kind, in which the engineering department of a large railroad called upon an organization for information, counsel and advice. The company placed in the hands of the engineering force the entire resources and information of the organization. Time and study were necessary to ascertain the facts. The engineering department fully appreciated the work, but when the new equipment was to be ordered and bids were requested the contract went to a competitive house. True, the first price was slightly lower. The railroad presumably saved something, but will the final result be the same? Isn't it likely that the company able to give the service, established in the industry, knows its business from A to Z, would be more likely to deliver promptly the product on which the ultimate cost will be lower, than the newcomer in the field who hadn't had to bear the burden of development? Isn't it possible there is some little thing which makes this company's device better than that of the new man?

John Smith Arrives

Once upon a time, which is still the accepted way of starting this kind of story, a school teacher passed around the room slips of paper bearing these peculiar words: "Plethorines, Zodorath, Coscascocetes," and then asked her astonished pupils to say what they were. For a few moments the class was silent. Then a small boy screeched, shrilly, "I know, teacher; they're Pullmans."

Plethorines and the others are going out of style

for sleeping cars. Plain "John Smith" rolled out of San Francisco recently over Southern Pacific tracks, as snappy a Pullman as ever was seen, en route to Chicago. With 55 others whose names have not been reported to us, John Smith represents an investment of $2,800,000.

What, we ask you, is railroading coming to, these days? Red and green locomotives on the Baltimore & Ohio bearing names of dead and gone Presidents of the United States; gold striped locomotives on the Chicago Great Western. Is Main Street in the ascendant?

The Pleasant Journey

One of the best ways to see the backyards of America is to take a railroad journey. Because of insurmountable difficulties over rights of way this may never be changed. But one thing the railroads can do; some already are doing it; some have been doing it for years. They can beautify their station grounds. Some companies are lamentably indifferent to anything but traffic and the famous net return. On such properties the stations and yards are an offense to the public but particularly to the part of it which travels. Station agents on such roads, partaking of the prevalent lack of spirit, are slovenly and unkempt. Their windows are grimy, their stoves are red with rust. No one likes to do business with such frowzy employes.

A hopeful and encouraging note comes from the St. Louis-San Francisco R.R. on which 430 section foremen and station agents have availed themselves of the company's offer to provide free seeds, plants and bulbs, with printed instructions for proper handling. Frisco stations and sections should be beautiful this summer and every summer hereafter and flowers, trim lawns, courteous employes—these can make people forget all about rates.

Adequate Transportation

When Herbert Hoover says anything it is worth hearing. By experience and training he is a citizen of the world. He is, indeed, more completely independent of all political influence than any man in the government service. There is special significance, therefore, and real sincerity, in what he said not long ago about American railroads.

"The work of our railway managers, and the results of your cooperation," said the secretary, addressing the Atlantic States Shippers' Advisory Board at Washington, "have brought about an industrial accomplishment such as I do not believe we have ever seen in our country in so short a period. The railways came out of the war thoroughly demoralized. Transportation had been subject to periodic car shortages for years before that; and in so short a time as five years we find the country equipped perhaps for the first time with completely adequate transportation.

"It is worth remembering that in 1921 our railways had loaded 42 million cars as against 52 millions last year, and that in 1921, they required 1,800,000 men, whereas last year they worked under 1,750,000—an increase of ten million cars of freight, with an actual decrease in the personnel of the railroads. * * *

"It is rather an interesting commentary on government ownership of railroads that at the time the railways came out from the government operation they were employing somewhere near 1,900,000 men; that they have increased the traffic they handled at that time by something over 20 per cent, and that they are handling it with 200,000 fewer men.

"If any one wants to argue the question of government ownership of railways in the United States, he has to get over this concrete demonstration of the capacity of private ownership to solve its own problems."

Where the Trouble Lies

Queer, isn't it, that farmers seem unable to understand that the relief they need is not in Washington but in their own state and local governments at home. Mark Sullivan says in World's Work that every time Secretary Mellon took off a dollar of taxes in Washington these local governments put it on again.

The national debt was 26 billion 600 million dollars in 1919. This was whittled down to 19 billion 100 million in 1926. A fourth of our national debt had been paid off in a trifle over six years, about one billion dollars a year.

However, the state, county and city governments of the country made up for it. Their aggregate liabilities amounted to six billion 700 million in 1919. These had risen to 12 billion 200 million in 1926.

The government at Washington collected five billion 400 million dollars in taxes in 1920; but in 1926 it levied but two billion 800 million. At the beginning of the same period the local tax-gatherers received three billion 200 million; yet at the close they obtained five billion 100 million.

The total number of persons who pay income taxes at Washington is a little over 5,000,000, or about one in 25. The average man is not touched by income taxation.

The farmers are fuming at Washington for relief. The truth is, they should be clamoring at their own state capitals and county seats. The farmer is taxed practically one-fifth of his annual income by his local governments.

A Neighborly Duty

Regulation of everything had not become a public fad when Robert Louis Stevenson was alive. But one gains the idea, in reading some of his philosophy, that he had a proper slant toward that bothersome subject. "There is an idea abroad among moral

people," said he, "that they should make their neighbors good. One person I have to make good: myself. But my duty to my neighbor is much more nearly expressed by saying that I have to make him happy if I may." This is just as good a rule in railroading as in literature.

Government Competition

The shipping interests are objecting, with some show of reason, against government competition. These interests would like to see the army and navy transport service abolished. One of the arguments advanced is that while such service was needed perhaps after the Spanish-American war to handle shipments of supplies for the Philippines and other possessions that day has passed. Government competition, it is pointed out, is unfair and is a waste of tax funds.

The railroads would be pleased also if government competition could be abolished. The Mississippi and Warrior River barge system, bought with the people's money and supported by the same source through government agencies, is in direct competition with privately owned railroads, which are paying now much more than a million dollars a day in taxation, referring only to Class 1 roads. The Panama Canal, paid for by the people, provides a highway for the most ruinous competition with railroads. There are other forms of government competition, but this will be enough for the present.

Economics and Economy

Some of the most interesting things in life are coincidences. Did you notice, for instance, that the day President Calles of Mexico established a financial dictatorship "to avert a threatened treasury deficit," the Pullman Co., delivered to him a five-car private train, said to be the most palatial thing ever built, and costing nearly half a million dollars? That same day President Calles ordered a reduction of 50 million pesos in the government budget and urged everyone to exercise the most rigid economy. Meanwhile the unhappy subjects of this economical ruler, hustling blindly for their daily tortillas, frijoles and chili con carne, will go on paying the bill.

"Paid By the Owners"

"Capital expenditures for improvement of Santa Fe facilities paid for by its owners are made as freely and as promptly when required in the public interest as are expenditures for maintenance which must be paid for out of earnings," says a bulletin issued from the office of S. T. Bledsoe, general counsel for the Santa Fe. Isn't this a distinction without a difference, "paid by owners" and "paid out of earnings"? Perhaps Mr. Bledsoe will tell us what is there about a railroad that isn't paid for, finally, by the public of which even the stockholders are a part? Capital expenditures, interest on bonded indebtedness, the principal, taxes, everything about a railroad comes from no other source. The sooner the public learns this fact the sooner may taxes be reduced.

The One Rule: Merit

So many men believe pull will help them along the road to success. One of the greatest orators of his day, Bourke Cockran of New York, once said, "There is but one straight road to success, and that is merit. The man who is successful is the man who is useful. Capacity never lacks opportunity. It can not remain undiscovered, because it is sought by too many eager to use it."

The Common People

Gladstone, himself a commoner, had sublime faith in the common people. "I painfully reflect," he said after his retirement from politics, "that in almost every political controversy of the last 50 years the leisured classes, the educated classes, the wealthy, the titled, have been in the wrong. The common people, the toilers, the men of uncommon sense—these have been responsible for nearly all of the social reform measures which the world accepts today."

The Importance of Preparation

"The crying evil of the young man who enters business today" said the late Theodore N. Vail, head of the great telephone company, "is the lack of application, preparation, and thoroughness, with ambition but without the willingness to struggle to gain his desired end. There is too little idea of personal responsibility; too much of 'the world owes me a living,' forgetting that if the world does owe you a living you yourself must be your own collector."

Robbing the Farmers

The harassed farmers, driven from the stubborn glebe by low prices and high freight rates, continue to find a place in the news. Two of them, from Kansas this time, broke into the papers recently in Los Angeles. While struggling with others to enter Aimee McPherson's temple for evening services, their pockets were picked, but not by real estate men. One of the farmers lost $725 while the other parted with all he had with him, which chanced to be $5. Both were "retired" farmers, they said, spending the winter in California.

Men who work just enough "to get by," and there are many, should use their stolen time to read Horace Greeley. "The darkest hour in any man's life," said the great editor, "is when he sits down to plan how to get money without earning it."

What's the News in Washington?

Coolidge on Consolidations

By W. E. Hopkins

DECISIONS of the Interstate Commerce Commission rejecting proposed mergers of railroads should not be construed as putting a stop to the making of such proposals or constitute a check on proper unifications, in the opinion of President Coolidge.

The President's views were outlined briefly just after the commission had issued its decision rejecting the southwestern merger proposal of L. F. Loree, chairman of the Kansas City Southern, as covered by the application of that road to acquire stock control of the Missouri-Kansas-Texas, and by the application of the Missouri-Kansas-Texas to acquire stock control of the St. Louis-Southwestern.

President Coolidge, it was said, believed that out of such decisions of the commission in the Nickel Plate and Loree cases, would come a set of principles that would govern acquisition cases under which the railroads could go forward with groupings of lines in the public interest.

The commission rejected the K. C. S. - M. K. T. - St. L. - S. plan largely because, under the arrangement proposed, the control of the properties would have been established by a comparatively small amount of stock of the Kansas City Southern. It made some favorable comment on the proposal from a transportation standpoint.

"This seems too small a base upon which to build such a financial pyramid," said the commission after pointing out that about $25,500,000 par value of Kansas City Southern stock with a market value of about $11,000,000 in November, 1926, could control the Kansas City Southern at the top of the pyramid, while the total recorded assets of the three companies involved aggregated $598,061,728.

It was suggested by the commission that it probably would be better to build the system around the Missouri - Kansas - Texas than around the Kansas City Southern, the smallest of the three properties. It is understood the applicants will come before the commission again with a revised plan. Commissioners Meyer, Hall, Lewis and Woodlock, who disapproved the rejection of the application, believed the commission should have made an effort to have the objectionable features of the plan removed before passing finally on it.

The Van Sweringens are now before the commission again with their revised merger plan, the Nickel Plate, the stem of the original system, being left out of the picture at this time. C. D. Mahaffie, director of the bureau of finance of the commission, has heard considerable testimony on the revised plan which contemplates the Chesapeake & Ohio shall acquire control of the Erie and Pere Marquette lines. The taking of testimony, temporarily interrupted May 18, was to have been resumed June 1. Henry W. Anderson, chief counsel for the Chesapeake & Ohio minority stockholders, has begun building up his case on the basis of cross examination. Each witness put on by the Chesapeake & Ohio must submit to detailed examination by Mr. Anderson. It appears that the hearing will be in progress for some time.

A decision by the federal court at St. Louis in the injunction proceedings instituted by the St. Louis & O'Fallon to prevent enforcement of the commission's order requiring the carrier to pay approximately $226,000, with interest, in excess earnings to the government, under the recapture provisions of the Transportation Act, probably will be delayed for some time. The commission has postponed the effective date of its order from May 15 to July 15, and a further postponment is expected. The case is generally recognized as a test case and there will be cooperation therefore between the government and the carriers in getting the issues properly before the court without undue haste. Walter L. Fisher, formerly secretary of the interior, has been employed as special counsel for the commission in the St. Louis & O'Fallon case.

The St. Louis & O'Fallon attacks the commission recapture order as void because, among other things, it is based on a valuation of the carrier's property not in accord with the law. The valuation was made, it is alleged, without giving sufficient weight to the cost of reproduction of the property, and without giving substantial and effective weight to the great increase in the cost of labor, materials and equipment over and above prices of 1914 that occurred since 1914. The valuation, it is alleged by the carrier, was based primarily on and is only slightly in excess of the cost of reproduction, less depreciation as found by the commission, at prices of labor and materials current on June 30, 1914, and for a number of years prior thereto. The case is headed for the Supreme Court of the United States which will decide

whether or not the commission's method of valuing the property was in accord with the law.

The emergency created by the floods in the Mississippi Valley has been recognized by the commission with the issuance of two service orders, Nos. 44 and 45. No. 44 permits carriers in the affected areas to move traffic regardless of routing instructions of shippers or of other railroads. No. 45 permits the Texas & New Orleans to operate a boat line between New Orleans and Galveston and Houston, in lieu of its rail service between those points, on account of the flood conditions.

Investigation of live stock rates in the West and the South, under the Hoch-Smith resolution, has been ordered by the commission. The commission announced it was its intention to deal comprehensively with the whole system of live stock rates in the western district and in the South. In the western division of the proceedings, hearings were scheduled to start at Salt Lake City June 30. A hearing will be held at Portland, Oreg., July 5, and at Los Angeles, July 15. Examiners Stiles and Parker will conduct the hearings. In the southern division of the proceedings, hearings will be held at Montgomery, Ala., July 27, and at Louisville, August 1, before Examiners Stiles and Parker. Commissioner Taylor will sit at the Montgomery hearing.

The government barge line has lost the first round of its attempt to have through routes and joint rates established between the Twin Cities and points in Illinois, Indiana, Iowa and Missouri, in connection with the barge line on the upper Mississippi river, from Dubuque, Ia., the barge line point of interchange, to the Twin Cities. Attorney - Examiner John H. Howell has recommended the commission dismiss the complaint of the barge line on the ground that the establishment of the through routes and joint rates, would not be justified. The northwestern railroad opposed the establishing of the through routes and joint rates, contending the existing rail routes were ample to meet the transportation demands of the sections of the country involved, and that establishing joint rail-and-barge rates lower than the existing all rail rates, as asked by the barge line, would further deplete their revenues at a time when the rail lines in the northwest were badly in need of revenue.

The Supreme Court of the United States, in an opinion by Associate Justice Butler, in No. 242, C. M. & St. P. et al. vs. Idaho public utilities commission, set aside a decision of the Idaho supreme court upholding an order of the state commissions requiring the railroads to reduce approximately 10 per cent the state rates on saw logs between points in Idaho. The highest court said the state commission did not hold a regular rate hearing in the matter, and that it reached its conclusions by methods that were arbitrary and constituted a denial of due process of law. The action of the state commission was taken after the decision of the Interstate Commerce Commission in Reduced Rates, 1922, on the theory that since interstate rates were generally reduced 10 per cent, the Idaho rates on logs should be reduced 10 per cent. The carriers, however, had not reduced either their interstate or intrastate rates on logs when the state commission acted. The court said in effect that the fact that the federal commission had authorized a 10 per cent cut in interstate rates did not authorize the state commission to order a reduction in state rates without a regular rate hearing.

The shipping board and intercoastal steamship lines have obtained suspension by the commission of a proposed reduction by western transcontinental railroads in the rates on canned fruits and vegetables from Pacific Coast territory to eastern destinations. The rail lines proposed to reduce the rates from $1.05 to 90 cents a hundred pounds. The shipping board contended if the reduction were permitted to become effective water transportation via the Panama Canal might be injured. The commission will investigate the matter and decide as to whether the reductions should be permitted to go into effect.

Fuel for road locomotives in freight and passenger train service, Class I roads, cost $84,807,252 in the three months ended with March as compared with $84,271,898 for the same period of 1926, according to statistics compiled by the bureau of statistics of the commission. Total cost of coal was $69,715,810, as compared with $69,667,914 in the three months ended with March, 1926. Total cost of fuel oil was $15,091,442, as compared with $14,603,984 for the three months ended with March, 1926. The average cost per ton of coal was $2.69 as compared with $2.63 in the 1926 period. The average cost per gallon of fuel oil was 2.98 cents as compared with 2.90 cents in the 1926 period.

The frequency of train wrecks on the Trans-Caucasian railways has led the soviet government to announce that hereafter not only the engineers and firemen concerned will be punished, but severe prison sentences will be imposed on any high officials found responsible for wrecks.

Ninety-five per cent of the statements about probable future trends in agriculture published in the 1925 and 1926 outlook reports of the bureau of agricultural economics at Washington were borne out by later developments.

Saving By Spending for Safety

Where Penny Pinching Is Costly

By William S. Wollner

THE smaller and less prosperous railroads frequently do not go into organized accident prevention work because it is believed the expense of maintaining a safety organization and making its recommendations effective is a luxury that can not be afforded. The reverse is true. The smaller or less prosperous property has far greater need for an efficient safety organization. It can not afford the expense of serious or frequent accidents. When a road is running close to the dividing line between profit and loss, or is, perhaps, bearing up under a continued loss, the expense of a serious accident may force it into bankruptcy.

The suggestion may be made that this contingency can be provided against through liability insurance, but a road of this kind can scarcely pay for such protection

As to workmen's compensation insurance, because the experience of the insurance companies is limited to logging and similar railroads, the rates are in accordance therewith and on a scale that makes this form of insurance prohibitive to the ordinary railroad. Incidentally, no insurance can compensate for the loss of morale and operating efficiency resulting from accidents, and a high state of morale and efficiency is extremely important to the impoverished carrier.

Although the results obtained through an efficient safety department unquestionably warrant liberal expenditure, it is not necessary to spend a great deal upon a safety organization. On a small property the man in charge of safety can handle in addition, many other activities connected with the safety program such as supervision of fire prevention and protection, employment, medical service, group insurance, welfare activities, plant publication, publicity.

The man handling accident prevention work must be versatile because of the many angles of the situation, and his versatility makes its possible to use him in the other activities of the road. Incidentally, the adding of functions to the safety department permits the building up of a supporting staff for the safety engineer which is a necessity on any road. A safety department should effect as a very minimum an annual saving in compensation cost amounting to at least three or four times its payroll, and if it does only this it justifies its cost. If there are added to the saving in compensation the intangible values such as improved morale, lessened labor turn-over, improved employe relations, the safety organization will be found to be earning ten to one hundred times the amount expended in its maintenance.

The Northwestern Pacific is typical of the smaller and less prosperous railroads on which a safety organization may be made a paying investment. With something over two million locomotive-miles and about five and a half million man-hours annually, this road operating about 500 miles, has passed through a period of more than 40 months without one employe on duty being killed in an accident. The longest preceding no-fatality period was nine months, and the average no-fatality period for many years before the present period was four months. Assuming the cost of an employe fatality at $5,000, this road has saved $15,000 a year during the last three years in this one item.

Added to the saving resulting from no fatalities is the compensation cost for injuries to employes. During 1926 there was an increase of 22.1 per cent in the number of locomotive miles run per train and train service casualty as compared with the first year of organized safety work, and an increase of 26.7 per cent in man-hours worked per non-train casualty.

During 1925 only one day's compensation was paid for every 2180 days worked. Every year during the past several years this road's employes have improved their accident prevention record. In the three years ended in 1926, casualties to employes per million man-hours worked were decreased 31.2 per cent.

The Northwestern Pacific went into organized safety work during 1918, proceeding along conventional lines. Five committees were organized, the general committee consisting of the general officers of the company, while the two division committees, the shops and the steamers committees, were composed of local officers and employes, the officers being permanent members while the employe membership were changed at stated periods. Under this plan accident occurrence was reduced but not in a degree that had been hoped for, nor that seemed warranted in view of the expense entailed. It was found that while safety committee members were very likely to find and report for correction physical hazards of such magnitude that their existence was already known to the management, they failed to

find the less obvious but just as deadly ones.

It was also found that due to the family feeling prevailing among the employes of this comparatively small road, committee members did not report unsafe practices. At one of the first meetings a condition, which was presumed to be unsafe although it has been in existence for a great many years and never caused an accident, was reported. It would have cost a very large sum to correct this condition and for these reasons the suggestion was not adopted by the management. Nevertheless, this situation was referred to at frequent intervals, while conditions which would have cost a few dollars to correct and practices that were resulting in frequent accidents were never mentioned.

In 1922 this road ceased holding safety committee meetings and thereafter relied upon more frequent and thorough inspection and supervision to discover hazards, and effect their correction. The entire property is under almost continuous inspection by the safety department and the officers in charge of the various departments and divisions. With this inspection and supervision has gone an intensive campaign to educate employes in the value of safety and how to prevent accidents. This has been carried out largely through articles in the road's magazine, but safety bulletins have been used as well.

An interesting by-product of the employe accident prevention work has been the reducing of the number of accidents occurring at the road's crossings. In every year up to and including 1923, there were more accidents at Northwestern Pacific crossings than during the preceding year. In the fall of 1923 the safety department started a campaign of education for automobile drivers. The success of this campaign was proved by fewer accidents in the years 1924, 1925, and 1926 than during the preceding year.

Another by-product has been a lessening of the number of fires occurring on the road's property. The matter of improved relations by the management and employes and better morale have already been mentioned.

In 1927 the employes of the Northwestern Pacific began to conduct an accident prevention competition in which all departments and divisions compete on the basis of their previous performance. The average accident record for 1924, 1925 and 1926, based on man-hours and locomotive-miles per casualty, is taken as the basis against which the employes compete. The percentage of reduction will decide the standing of the units.

It is believed that within the next year or two, despite the small amount of money available for expenditure on even so good a cause as accident prevention, the Northwestern Pacific's record will compare favorably with that of any in the country.

Key Systems Spend A Million

How the Key System Transit Co. plans to spend more than $1,000,000 for betterments of various kinds during the next few months was described recently by Lester Ready, president, following a meeting of the directors at which his plan was approved.

"A large amount of the work was done in upper Fruitvale and Dimond during 1926 and will be completed this year," he said.

"Three other points in East Oakland will be given large appropriations, one of the most important being the complete and permanent reconstruction of East Eighteenth street from Fourth to Fourteenth avenues. This has been given $86,400 in the program.

"The line on Foothill boulevard from Fruitvale avenue to Thirty-fifty avenue will be rebuilt at a cost of $39,600.

"The last piece of East Oakland work is that on East Sixteenth street. In arranging for this work we have received the most cordial co-operation of the property owners, who have shown themselves to be forward looking citizens with the interests, not alone of their own district, but the whole pending city planning project at heart.

"In this case the property owners have entered into a contract to repave East Sixteenth street. They and the Key System officials conferred several times among themselves and a plan has been worked out to the benefit of all.

"The total program will call for an expenditure of $1,200,000 which is further evidence of the faith of the Key System Transit Company in the future of the east bay territory. An expenditure of more than $1,000,000 a year in new track and new equipment is an important fact in the life of this community. Much of this goes into wages to east bay residents, and the Key System is adding to the prosperity of the entire district by these heavy reconstruction programs."

Abolish the Crossings

Engineer Jacobson says it is necessary to whistle 97 times for road crossings between Pueblo and Horace. Mechanical engineers estimate that 15 pounds of coal is used for each signal. This figures to 1,455 pounds of coal to protect the public at road crossings on the Colorado division.—Missouri Pacific Magazine.

Safe And Sound

Stop and let the train go by,
It hardly takes a minute;
Your car starts off again intact,
And better still—you're in it.

If you can't trust yourself then don't expect credit from others.

Cutting Out Grade Crossings

THERE are about 250 grade crossings on the state highway system in California exclusive of industrial spur tracks. By installing automatic warning lights the highway commission has tried to reduce the hazard at these crossings, but still accidents occur. Now the commission has recommended a bond issue of ten million dollars, in its biennial report, to pay for the state's share in abolishing these dangerous crossings.

The Montebello Subway on Whittier Boulevard, Los Angeles County

Recently when Whittier boulevard was reconstructed between Los Angeles and Whittier a dangerous crossing of the Union Pacific R. R. was eliminated by the building of an underpass with two 28-foot openings for traffic as shown in photo No. 1. The county, state, and the railroad joined in financing this project, the highway commission meeting the cost of the pavement through the subway, slope paving and retaining walls, and the lighting and dewatering systems. The railroad raised its grade seven feet, so that the floor of the underpass would be above the groundwater level. This proved less costly than the heavier construction that otherwise would have been necessary to resist the hydrostatic pressure of groundwater.

Picture No. 2 shows a concrete structure that carries the highway over the Southern Pacific tracks in San Luis Obispo county, which eliminated a dangerous railroad crossing.

Elimination of 18 grade crossings, seven of which are in southern California, were authorized by the California railroad commission during 1926. The aggregate cost of the construction was set at $3,075,379, with individual costs ranging from $500,000 to $1,099,284.

Among grade crossing eliminations ordered during the year in addition to those already named, were those at Brand and Los Feliz boulevards, Glendale; Pico and Tremaine boulevards, near Los Angeles; Pomona and Valley boulevards in the county; and Seventh street and Downey road within the city.

Concrete Structure Over the Southern Pacific Tracks at Pismo, San Luis Obispo County, Cal.

The I. C. C. Personnel

Including the latest appointments the membership of the Interstate Commerce Commission is:

John J. Esch, Chairman (Wis.)
Balthasar H. Meyer (Wisconsin)
Henry C. Hall (Colorado)
Clyde B. Aitchison (Oregon)
Joseph B. Eastman (Mass.)
Johnston B. Campbell (Wash.)
Ernest I. Lewis (Indiana)
Frank McManamy (Wash., D. C.)
Thomas F. Woodlock (New York)
Richard V. Taylor (Alabama)
Ezra Brainerd, Jr. (Oklahoma)

Ezra Brainerd, banker and lawyer of Muskogee, Okla., the member most recently appointed, succeeded Frederick I. Cox of New Jersey, whose term had expired. Mr. Brainerd is a Republican. He was born in Vermont in 1878, educated at Middlebury College, Colgate University and the University of Michigan. He received his law degree from the latter institution in 1904.

Rates in Great Britain

The latest railroad rates in Great Britain, announced after long and painstaking hearings, are approximately 60 per cent in excess of the level of 1913. These rates are in the main those proposed by the railways. The new schedule makes no change in the passenger rates now in effect; slightly lowers the prevailing rates for workmen's tickets approximately 6½ per cent. The railway rates tribunal was instructed by law to set up rates which would, during the first year they were effective, produce a standard gross return, designed to give the railways their net of 1913

They're Buying Motors In Brazil

Notes On Foreign Markets

By Howard Kennedy

BRAZIL is coming rapidly to the front as a market for motor cars. In 1926 that country was the fourth most important world buyer of American passenger cars, being preceded onlv by Australia, Argentina, and Canada. Its importance as a truck market was second only to that of Australia. The long distances to be traversed and the need for motorized transportation in the rich coffee district in the states of Minas Geraes and Sao Paulo have been the chief factors instrumental in making Brazil the most important South American market for trucks of United States manufacture, and the second most important market for these vehicles in the world. Total exports of all automotive products to Brazil during 1926 amounted to $17,217,845 as compared with $18,239,413 in 1925 and $10,741,689 in 1924.

The United States exported to Brazil 16,703 passenger cars in 1926 valued at $10,192,169, as compared with 13,974 units valued at $9,204,431 in 1925 and 5,389 units with a valuation of $4,099,-485 in 1924, the percentage increase of units in 1925 over the previous year amounting to 161 per cent, while in 1926 an increase of 20 per cent was recorded. Trade in motor trucks has similarly been increasing rapidly during the past few years, exports of these vehicles registering an increase of 180 per cent in 1925 over the previous years and 25 per cent in 1926. Total units exported during the latter year amounted to 5,886 valued at $2,701,098.

Of the total number of passenger cars and trucks in operation in Brazil approximately 95 per cent are of American manufacture. European competition is practically negligible except in the case of buses. In Rio de Janeiro, American buses account for only 5 per cent of the total in operation. In Sao Paulo this average is somewhat higher, however, since many of the buses operated in this city are of American manufacture instead of English and Italian which is the case in Rio de Janiero.

Motor bus transportation in Brazil is rapidly gaining popularity, as evidenced by the tremendous increase in the registrations of these vehicles during the last few years. Excellent bus services are now available to the suburban residents of Rio de Janeiro, and many of the other large centers of the coun-

A Train of International Trucks on A Country Road Hauling Farm Produce.

try are extending lines to cover greater areas. Much remains to be done, however, in furthering this type of transportation inasmuch as the narrowness of the streets in Brazilian cities restricts the use of buses to main thoroughfares. Interurban bus lines exist to some extent in the states of Sao Paulo and Minas Geraes, but with the exception of these, this type of transportation in the rural districts has not been developed to any great extent, due chiefly to the lack of adequate roads.

In spite of the general economic depression in Brazil during 1926, sales of automotive products held up fairly well. The first quarter of the year marked a period of unusually high sales, while during the second quarter sales were comparatively good, having fallen off only to the extent of the usual seasonal decline. Nevertheless, this decline was less apparent than it had been for some years, probably due to the growing demand created by the opening of new roads and the wide publicity given to motoring as a diversion.

Sales of automotive vehicles in the Rio de Janeiro district during the latter part of 1926 were somewhat higher than the corresponding 1925 period. The unsatisfactory business conditions which existed during practically all of 1926 began to give way to the effects of less stringent credit conditions and greater commercial confidence in general.

A considerable increase in the sales of all automotive products was experienced in Brazil during the first quarter of 1927. Regardless, however, of the fact that sales increased considerably over the preceding months, practically all local dealers consider the increase as having fallen short of what had been expected.

Motor Cars in Germany Increase

One of the outstanding developments accompanying the economic rehabilitation of Germany is the increasing demand for all kinds of motor vehicles. In a report released by the commerce department, H. C. Schuette of the automotive division draws attention to the fact that probably in no country of the world are conditions more favorable for the rapid expansion of the automotive industry than the German Republic.

Germany ranks sixth today in the number of automobiles registered, and has one motor vehicle to every 198 persons, as compared with one to every five in the United States; one to 53 in France and one to 55 in Great Britain. The present registration of motor cars in Germany, the report reveals, is more than four times that of the prewar period, and has practically doubled in the last three years. Germany ranks second to Great Britain in the use of motor cycles, and registrations of this

P. & A. Photo

Leonard F. Muhlheim, Rural Mail Carrier of Oelwein, Iowa, and the Car He Had Built, The "Mud Hen", So He Might Travel Over Some of Central Iowa's Famous Highways.

A Contrast in Transportation in the Desert of Death Valley. The A. C. F. Coach.

type of vehicle are increasing rapidly.

According to Mr. Schuette, the German automobile industry has been able to supply fully 70 per cent of the German demand, although he points out that the popularity of American cars and trucks is growing. Last year United States exports of automotive products to Germany reached a record figure of $5,240,000, which was an increase of almost $3,000,000 over a three year period.

Two obstacles which have had a deterrent effect on the sales of American cars in Germany are the high import duties levied and the internal taxes based on horsepower. The tariff, however, is being revised downward and after July, 1928, the duties will be equivalent to approximately 30 per cent ad valorem. This duty compares favorably with that imposed on imported cars in other countries which are excellent markets for American cars. There has been some agitation within Germany for the substitution of a gasoline tax for the tax on horsepower, but it is improbable that this modification will be made in the near future.

The American system of mass production of automobiles, the report reveals, was not employed in Germany until as late as 1922. What progress the German manufacturers have made in this direction, it is stated, probably has been directly due to the influx of foreign made cars, which with a few exceptions, can undersell all German cars in their class.

Accessory Exports Are Growing

The increasing use of American servicing appliances is bringing about a noticeable improvement in motoring conditions abroad. The superiority of American equipment, a bulletin from the U. S. department of commerce, automotive division says, is universally recognized, and only the price factor enables European manufacturers to compete successfully. United States export trade in automobile appliances has gained strikingly in recent years, the report points out. Unfortunately, statistics of such items as battery-charging apparatus, electric motors, portable electric tools and air compressors intended for the automobile trade cannot be separated from those items designed for other industrial purposes. However, the exports of those items of service apparatus peculiar to the automobile have increased almost sixfold since 1923, the first year that they were separately classified, rising from something over $1,000,000 to $6,800,000 in 1926.

Fully one-half of the service appliances in use in Latin American countries, in Asia, Australia, and New Zealand, the report shows, is of American origin. In many countries the proportion is over 90 per cent. Western Europe is naturally our most competitive market, but even here the American product is steadily gaining ground.

The increase in battery-charging facilities throughout the world in recent years is striking, it is disclosed. Practically every large city now has ample battery service facilities and these are rapidly being extended to the outlying districts. This is a radical change from the conditions prevalent a few years ago when American cars without magneto equipment could hardly be sold abroad for lack of these facilities.

Portable drills, small garage tools, reamers and tire-repair outfits are used abroad wherever service facilities are available. In the case of such appliances as air compressors and electric tools of various kinds this situation does not obtain, however. Foreign wages are much lower than in the United States and the foreign auto-mechanic has not yet reached the level of efficiency which prevails in this country. Foreign service-station managers, as a result, are reluctant to install expensive and complicated machinery under present labor conditions.

Movies in the Auto Trade

Motion picture films demonstrating uses to which buses and

A Fine Example of the Fageol Safety Coach Made in the Oakland Plant.

The Growth of Democracy Is Encouraged in the Public Schools. The Bus Rides Are Enjoyed by All the Children.

trucks are put by leading railroads in coordinated rail and motor services are being produced by the foreign trade department of the National Automobile Chamber of Commerce for use abroad illustrating for those interested in motor transport the development along these lines now going on in the United States.

First public showings of this film will be given throughout South America by George F. Bauer, secretary of the foreign trade committee, who has started on a four months' speaking tour on that continent. In addition, he will have with him other films including one previously produced by the chamber showing motor traffic control methods.

Boulder Creek Stage Sold

The Boulder Creek stage line operating between Santa Cruz and Boulder Creek was purchased some time ago by T. B. Wilson. Mr. Wilson has recently been appointed vice-president and manager of the Southern Pacific Motor Transport Co. and will turn over the Boulder Creek stage line to the Southern Pacific Motor Transport Co. when its operations are established. Operation of the Boulder Creek stage line will be improved for the public through application of more modern equipment and through coordination of schedules with Southern Pacific train service.

Katy Builds Automobile Cars

Construction of a model automobile car of 100,000 pounds capacity has just been completed at the Katy shops in Denison. The building of this car started a car construction program that will include 500 of these cars, as a part of the $2,168,825 expenditure for improved rolling stock contained in the Katy budgets for 1927. The cars are a most improved type and their plans and specifications have been approved by various automobile manufacturers, to whom they were submitted before the year's car building was began. They are so designed that they may be used quite as well for furniture and other bulky freight, such as grain, as for the particular traffic for which they were designed.

Do You Know Your Costs?

As knowledge of detailed costs in motor bus operation increases the highway passenger vehicle appears to be less a menace to railroad profits than it seemed at its advent. Experienced bus operators still disagree widely on bus mile costs under given conditions, giving outside observers the impression that many of them do not really know whether they are making profits or losses. They find it easy enough to take business away from the railroads says the Wall Street Journal, but not always a simple matter to keep expenses, taxes, depreciation and interest safely covered by revenues.

Certain data gathered by a committee of the Minnesota legislature, in a state where bus service has expanded rapidly in recent

The Modern Business Firm Must Have Dependable Delivery Power.

years, are at least tentatively significant. The figures are incomplete, particularly as to net earnings, but it appears to be conceded that average earnings of 24½ cents a bus mile for 22 companies using 398 vehicles and making almost 19,000,000 bus miles last year failed to return a net profit. The aggregate loss is variously estimated up to $500,000. From the fact that revenues per bus mile ranged all the way from six to more than 31 cents, it must be concluded that routes were established in many cases with little regard for the existing degree of "public convenience and necessity."

Bus and truck service on the highways is a permanent institution, but it is still in its unruly youth. President Byram of the C. M. & St. P. once remarked that it would be possible for the gasoline vehicle to destroy what it could not replace. There is no good reason why a highway service should be allowed to deplete the revenues and resources of a steam carrier even temporarily, if all it can do for itself is to insure self-destructive deficits.

Still Selling Motor Cars

There are more than 22 million motor vehicles in the United States, according to a recent report of the bureau of public roads of the department of agriculture. This report is based on figures supplied by state registration agencies. It shows an increase of slightly more than 2,000,000 vehicles over the preceding year. New York led all the states with 1,815,434 registrations and $28,786,421 in receipts. California came second with 1,600,475 registrations and $8,477,233 in receipts. Ohio was third, with 1,480,246 registrations and $9,818,873 in receipts.

The next four places were filled by: Pennsylvania, 1,455,184 and $24,045,349; Illinois, 1,370,503 and $14,047,208; Michigan, 1,118,785 and $16,953,685; and Texas, 1,049,869 and $14,362,883.

Florida's increase of 40.2 per cent, not including non-resident registrations, was the greatest. Oklahoma with 17.8 per cent came next, and Alabama, Idaho, Louisiana, Mississippi and Utah followed with increases of 15 per cent.

Of the total number of vehicles registered, 19,237,171 were passenger automobiles, taxis and buses, the remainder being motor trucks and tractors. The increase in the latter class was 13.2 per cent.

Receipts for registration fees, licenses and such, amounted to $288,282,352 in 1926, as compared with $260,619,621 the preceding year.

Here's A Rate War

The first steps in what may develop into a real rate war between railroads and bus operators began the middle of May at San Antonio, Tex., when the Southern Pacific lines cut passenger fares from 10 to 45 per cent. with the announcement that the system intended to offer more attractive rates than the bus lines.

Buses, it was declared, have resulted in railroads losing approximately 59 per cent of their short-haul business within the last few years. Developments also revealed that the Missouri Pacific lines had duplicated the slashes announced by the Southern Pacific 24 hours before.

Although bus operators made no definite announcements regarding their actions, it was believed that a cut in rates might follow.

He Knew The Others

"You are a traveler, sir," said a passenger in a local train, "and perhaps you are familiar with Mudwich?"

"'Yes," replied the other passenger. "I call there on every trip."

"Glad to hear it. I've never been there. Which hotel would you advise me to stop at?"

"The Majestic."

"Do you always go there?"

"No. I've never stopped there, but I've been to all the others."—Exchange.

Motor Cars in 1903

In May, 1903, Motor Age said, editorially, "It is not improbable that arrangements will be made at the St. Louis Exposition for admission of automobiles to a part of the grounds." Ten years previously, in 1893, thousands of persons gathered in Michigan avenue one day to see an automobile run up and down the street. Nowadays a horse on that thoroughfare is a sight almost as unusual.

"The inclement weather of last spring cost the country a cool $600,000,000," says Dr. Ellsworth Huntington of Yale, choosing well his adjective. The feeling is general that something radical ought to be done about the weather. We hardly know what to suggest, unless it be to come to California.

Do the duty which lies nearest to thee, which thou knowest to be a Duty! Thy second duty will already have become clear.—Carlyle.

Just try the cultivation of the sunny side of your nature for a year. It would revolutionize your whole life.—O. S. Marden.

There is no business, no avocation, whatever, which will not permit a man, who has the inclination, to give a little time, every day, to study.—Daniel Wyttenbach.

It is the duty of every man to protect himself and those associated with him from accidents which may result in injury or death.—Abraham Lincoln.

Little Stories About Big Men

THE tradition about coming up from the ranks, says a recent writer, has become firmly established on the American railroad. From the time when it was thought best to select a man who could command the credit resources of the country there has been a gradual evolution of the presidential function until today an examination of the training received by the men heading 29 of the more important railways discloses that 28 have spent long years of apprenticeship in learning the railroad business.

Eleven of the 29 began in the operating department, six reached their positions through the traffic department, seven were engineers by profession and four spent their period of apprenticeship in the legal department. The twenty-ninth president is an exception to the rule. He began railroading as a director at the age of 26.

Thirteen were college men who did not hesitate to enter railroad service in positions of nominal pay and long hours, while 16 received only public school education, and fought their way from jobs as section hands, clerks or brakemen, most of them beginning in their teens.

One of the newer railroad presidents of the Southwest is Columbus Haile, elected at the close of 1926 to the presidency of the M-K-T Lines, with headquarters in St. Louis. Mr. Haile's career sustains the tradition that most great railroad executives rise from the ranks, but it upsets one almost equally well-established that college-bred men rarely rise to the heights in railroad service. Mr. Haile is a native of Alabama, and received his collegiate education at the University of Virginia. But those close to him say doubtless he would agree that his real education was acquired after his first job as a clerk in a railroad office in Texas.

The first job referred to was at Dallas in 1889 in the "Katy" freight traffic office. He stuck to that department throughout the years until he landed himself and his fine ability in the president's office last winter. All of which provides material for another fine argument familiar to most men: Should a man stay with one company, hoping someone may see him some day, and give him an encouraging pat on the back and a cheerful word, or should he go as far up as may seem possible at the time, and then sell his experience to some other outfit in which advancement seems more rapid? You can get an answer either way if you dig deep enough. There are many precedents.

HOW do some men become presidents of railroads; is promotion gained by sticking to one job, one company or by moving around? How does the college man get along on a railroad?

These and other interesting questions are considered in the human interest stories told this month about such men as Columbus Haile, president of the M-K-T Lines; President McDonald of the Southern Pacific's Texas-Louisiana Lines, and Louis W. Hill, chairman of the board of the Great Northern.

There's a story, too, about Mr. Hill's energetic son, L. W. Jr., who has started at the bottom of the railroad, and is determined to work to the top. Human stories, every one of them.

Columbus Haile believed in sticking, evidently. It took the years, as it always does, but up the well worn ladder he climbed; clerk, chief clerk, clerk of this and that and the other thing; division freight agent, assistant general freight agent, general freight agent, vice-president in charge of traffic, a post that came to him in 1907, and finally, there he was, president of the "Katy." And, just to give the directors a pleasant thrill, what did the gross revenues do, the first three months after his election, but jump a million dollars over the same period a year ago, which was a whole lot better than having them drop that much, should anyone ask you about it.

Mr. Haile is noted for his gracious manner, the force he puts into things, the energy he creates without bluster. Of course, Mr. Haile is married. Most of the men who have done and are doing big things are married—another good chance to argue. He and his family live at the Buckingham in St. Louis where he is said to be sociable and pleasant, not the Haile fellow well met, you understand, but sociable, and readily inclined to form friendships. He keeps his friends, too. He is sound and conservative in his views concerning the conduct of the great business of transportation and the relationship of the carriers to the shipping and traveling public. He has no fads, no peculiar theories of success except perhaps, that by making friends personally one makes friends for the institution he serves or directs.

The man who succeeded the late W. R. Scott as president of the Southern Pacific lines in Texas and Louisiana, is referred to officially and publicly as "H. D. McDonald of New York." But this is only for the record. Mr. McDonald is a Texan, and there is a very remarkable and important difference between the two. In one respect only they are alike: The New Yorker believes the sun rises off Sandy Hook and sets somewhere in Hoboken, N. J., while the Texan thinks it pulls off both stunts in his state.

Mr. McDonald, also, was a clerk in the beginning of his earning career. Like Columbus Haile, he stuck to one road until he found himself where, privately, he had always decided to go. Quite a number of railroad presidents came out of the traffic department, but Mr. McDonald was another kind of clerk. He worked his way up through the accounting forces, taking about 25 years for the journey. Not many have reached the same terminal along that route. During the quarter century he worked at Houston where he was born; at San Francisco where he became auditor for the Southern Pacific; New York as deputy controller, then controller; vice-chairman of the executive committee in June, 1925, and finally president of the Louisiana and Texas lines with headquarters in New York. Reads smoothly, perhaps, but 25 years full of figures and accounts is a serious business.

A. D. McDonald, President, Southern Pacific, Texas-Louisiana Lines

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Family tradition is a fine thing. Especially when the tradition is worthy, when keeping it alive and vigorous means adding something to the public convenience. We told a story in the first issue of this magazine, last month, of five generations of one family engaged for 125 years in making steel tanks. Doubtless they made good tanks or the family tradition would have died. Pride of product is the foundation of family unity.

When a father builds for his son he knows he must put up a structure certain to appeal to his highest ideals. Of course this doesn't always work out, as history proves, because the finest fathers sometimes have bonehead sons, but in the long run if he takes time out occasionally to keep close to the boy; if he drops his steamship line or his bank or his railroad long enough to get into his son's good regard he will find him—the average boy—eager to follow in the pathway where the old man found so much happiness and profit. When James J. Hill built the Great Northern Ry., he was determined to produce a property certain to challenge the energy and the admiration of his sons after him. He learned the value of a dollar, if ever a man did, as an underpaid clerk in a frontier grocery store, and he passed the knowledge on to his boys. Particularly to Louis W. Hill who succeeded him. The boy who follows a great father has no easy job. His work is laid out for him from the first jump. He can do little that is likely to attract attention without being criticized, because the fortune was handed to him. He didn't have to make it. The best

Columbus Haile, President of Missouri-Kansas-Texas Lines

he can do is to stay out of the glare, work hard, beginning at the bottom, and emerge only when he knows the business from one end to the other. Such experience make some men "gun shy."

Unlike his father, Louis W. Hill is little known to the country at large. In fact he is scarcely known outside the territory which the Great Northern serves, and he is a stranger in Wall street, which knew the senior Hill as intimately as it knew Morgan, Rockefeller, Sage and other contemporaries of the great railroad builder.

"Louie" Hill, as he is known familiarly all along the Great Northern lines, has been railroading since he left Yale, in 1893. From then until the day of his father's death in 1916, the two were associated closely in the management of the Great Northern and other Hill properties. He is the only one of the three Hill sons to stick to railroading and is recognized as a strong executive.

Mr. Hill is now 55 years old. Thirty-five of these years have been spent in railroading, covering about everything from section and shop work to executive positions. He succeeded his father as president of the Great Northern in 1907 and became chairman of the board five years later.

And now along comes another generation, Louis W. Hill, Jr. There are three boys but this is the

only one to choose his grandfather's career as a railroader. He too, went to Yale. Also he had one year at Oxford university, after which he sprang blythely into a pair of overalls and went to work as a section hand. Next he took a course in the Great Northern shops at St. Paul, had a few months in the traffic department in that company's offices in San Francisco, and now has been assigned to the operating department, beginning as a clerk in one of the trainmasters' offices. Louis W. Hill, Sr., said several years ago that if he consulted his own inclinations he would retire from active railroad management. But he believed he owed it to his father to carry on. The third generation seems made of the same stuff. But the boy has one heavy handicap which might just as well be faced now. The father of the great Empire Builder wore a full beard. So did James J. Hill. So does Louis W. Sr. Has L. W. Jr. the courage?

Perhaps unconsciously these Hill generations are following the original Harriman program. Mr. Harriman said, many years ago, that by the time the average man was fitted by experience and training to assume heavy responsibilities he was too old. He encouraged young men just out of college, preferably from the engineering schools, to work six months or a year in various departments of his railroads. Sometimes they had to take pretty hard knocks, and they didn't all survive. They had to learn to take a bawling out and smile, and very often the occasion was made for their particular benefit. But if they made good and learned how to stand the gaff they landed eventually at the top. Some of them are there today. You can learn many things besides language in a switch shanty.

As most of us know, Harriman was not in the beginning a railroader. He started as a broker, a business in which he learned much about human beings that was to prove valuable when he began to buy and build and rehabilitate railroads. He acquired a fine philosophy of life, for one thing, and a lot of logic and common sense. Back of his practical philosophy Harriman had two viewpoints which he always kept in mind.

In 1907 he wrote for publication: "The railroad that does not seek to build up the territory through which it passes by offering good service pursues a policy that can only bring it to grief in the long run. It dries up its territory; the territory does not produce anything, and then there comes a day when there is nothing for the railroad to carry."

His second viewpoint was that one managing a railroad should be just as familiar with the physical side as the financial side of his properties. He was a keen observer and journeyed more than 5,000 miles, most of which he made by daylight in the observation car of a pushed train in order to acquaint himself with the physical property of the railroad he ultimately bought and reconstructed.

Way back in the lean and hungry nineties, when the emigration of southern whites north and west was still in large volume, a continuous exodus from 1865 to 1900 it was, Samuel Spencer, president of the Southern, and Milton Smith, then president of the L. & N., got in their business cars and met at some obscure junction in Georgia. There they planned the new rail empire of the Southeast. Facetiously they signed their letters, and conversations as taken down in the stenographers' notes, "Cortez" and "Pizarro."

Something more than twenty years afterward, when political idealism and "kept us out of war" was in full swing in Washington and railroad baiting was still a popular sport, Joseph Folk of Missouri began another investigation, and these "Cortez" and "Pizarro" letters came out. Spencer was dead, and Milton Smith was a very old man. Nothing came of the investigation.

War with its ruthless disregard of such trivialities came on, and the American people suddenly woke up to the fact that the important thing about railroads was that they should run, and have enough money to run on.

"There was something very significant about the playful use of the names of the two Spanish conquerors, by the men who started all that. Our civilization has constructive work for men of that kind. Give them railroads, or dynamos, or great factories to work with, and they will create wealth for everybody," says Harper Leech of the Chicago Tribune in telling the story.

"If the great conquerors of the precapitalistic ages were so largely destructive—although they were the great builders, too—was not the reason largely because of the limited means through which they could express their personalities? If ever the way to power for men of power is barred by silly socialistic regimentation, we may just as well expect a revival of military activity throughout the world."

Speaking of James J. Hill brings to mind a story told last winter in New York. George E. Spinney, a newspaper man, had assumed the management of a journal controlled by Mr. Hill. In re-aligning its staff he asked the financier what, personally, he knew of the qualities of an applicant for the post of advertising manager.

"He's a gentleman," Hill replied.

"But can he get business?" asked Spinney.

"Didn't I tell you he was a gentleman?"

"Fine for society—but signing contracts . . . "

"I don't get you at all," said Mr. Hill. "A gentleman is a business getter—a business getter has to be

a gentleman. Only a gentleman can have folks believe in him and it's the same thing everywhere—nobody is going to be a buying customer unless he's sold on the seller."

The London, Midland & Scottish is the largest combination of the four great groups into which English railroads have been consolidated. The others are the London & North Eastern, the Great Western and the Southern Railway. All, as suggested, are consolidations of numerous lines, a scheme entered into by England with the hope of effecting many important economies. The results have been so disappointing, as the railroad world now knows, that several of the nation's leading railroad men have come to America to study our transportation systems before we, too, commit the same error.

G. M. Burgess, general manager of the London, Midland & Scottish Ry., was in Los Angeles the middle of May. It was his first visit to America, and he was very properly astonished although not the kind of gentleman to expect buffalo and Indians running about the streets.

"Really," said Mr. Burgess, "you have developed beyond my greatest expectations. I am surprised by the rapid advancement achieved in the transportation line by you Americans. The hospitality of railroad employes we encountered is certainly unsurpassed and the service, relative to speed and comfort, is as good as any in the world."

But Mr. Burgess couldn't be induced to say a word about the jolly old consolidations. "O, positively not," he exclaimed, "not a word."

The line of which Mr. Burgess is general manager is, as we said a moment ago, the largest of four groups. It includes what Mr. Burgess said was "the first real double track passenger and goods railway, the Liverpool & Manchester, opened in 1830." The Stockton & Darlington was five years older, but at its inception it was, he said, little more than a single track mineral line. Other roads in this group make up a total of about 8,000 miles. So Mr. Burgess has a real job.

Early associations have a stronger influence than many persons imagine in shaping men's lives. In the little town of Colfax, Calif., a good many years ago, a very small boy thought it a wonderful privilege to help his father in the railroad express office. Eventually, as often happens in boys' lives, this one was wrapped up in the marvels of railroading. He knew every conductor and engineer by his first name. In his eyes the division superintendent was almost holy and, as he confessed not long ago, he regarded the general manager with feelings difficult now to realize—which may or may not have a double meaning, because the little boy is now William B. Storey, president of the Santa Fe System.

And here we have another discussion, for President Storey has worked for only one other railroad, the Southern Pacific with which he began his career in the engineering department. Mr. Storey was born in San Francisco, graduated from the University of California, and worked during vacations driving stakes on the line from Oakland Point to Berkeley.

Telling members of the Pacific Railway club some of his early experiences, one night last spring, Mr. Storey said the first really important thing that crops out in his memory is of a day in Colfax when the town celebrated the connecting of the Central Pacific and Union Pacific rails in Utah. "The older boys," said he, "fired anvils, the only adequate way of making sufficient noise. We had no cannon, but the firing of anvils is a very excellent substitute so far as making a noise is concerned. A few months after the connection was made the first through sleeping car excursion train passed through our town.

"The railroad of my boyhood days was a very primitive affair compared with today. The freight cars were 10-ton capacity; the fuel, wood, cut in two foot lengths; no ballast; rails, iron, about 54 lbs. to the yard laid without joint plates, a crude chair holding the ends together; bridges almost entirely of wood. The speed limit down hill on the Sierra Nevadas was 13 miles an hour. Before the completion of the overland road, all locomotives were brought by vessels from the East and before the completion of the line from San Francisco to Sacramento via Niles and Stockton, were transshipped to barges at San Francisco and taken on these to Sacramento. I recall at the time of my trip to Colfax in '65 that the locomotive was named, the 'Conness," I think. I remember two other names of those early days, the 'Governor Stanford' and 'T. D. Judah'."

A failure is easier to understand than a success.

Think of the Boy At Colfax, Awed by the Superintendent, and Now President of One of the Country's Leading Roads.

Offices and Reading Rooms of the Pacific Electric Club.

The P. E. Men Have A Club Home

There's A Summer Camp Also

By Harmon Campbell

WHEN you find a club with approximately 5,000 members, well equipped quarters, activities of one kind or another, social, business or amusement, nearly every evening in the week, and what has been declared to be probably the finest vacation camp in America owned by an industrial organization—with someone to absorb the losses incidental to all such undertakings—you have an example in sociology worth studying. In one sentence, this is the Pacific Electric Club of Los Angeles.

The club is an outgrowth, with many and varied amplifications, of the "queen contests" conducted in 1915. N. B. Vickrey was campaign manager of that undertaking. The officers and employes of the Pacific Electric cooperated in such a thoroughly human way at that time that someone suggested it would be a shame to disband the temporary organization. Paul Shoup, president of the Pacific Electric, approved the club idea and helped in the work of getting it started. For a time the organization had its home in the old Masonic club on Hill street, but when the big terminal was built there the employes had to move. Finally two floors of the concrete building at 514 East Eighth street were taken, and for nearly three years this has been the club's home. One of these days it may have a club building of its own.

All the members of a club of this kind do not, of course, have a chance to use its conveniences and comforts. The Pacific Electric operates about 600 miles of track so that its employes are to be found over quite a large territory, but the rooms are there with their inviting privileges whenever the men have time to use them. There are dances Thursday evenings. The club has its own orchestra made up from among the men, and it is a good one too, and a band of 45 pieces, nearly all of the musicians being employes. There is professional vaudeville from the regular circuits every other Friday night, and a meeting of some kind or other almost every day and evening.

To manage the club's varied activities an executive committee is elected every year. This committee is formed on the basis of one member to every hundred members or fraction of 50 or more from all departments. There are now 49 members of this kind on the committee plus four of the general officers of the company

appointed by the vice president and general manager. From this executive committee a governing board of eleven members is chosen, seven of whom are members of the executive committee and four of the company's general officers. This board elects a president yearly from among the four general officers mentioned, and also a secretary-manager with the approval of the vice president and general manager. This office is held, as it has been for several years, by N. B. Vickrey.

The club has many functions. Among these are the welfare work, the relief fund to give help in emergency cases, the group insurance, the mortuary or relief fund. The relief fund makes unnecessary "passing the hat," which is a feature in a good many organizations where no such fund is in existence, because someone always is having trouble of one kind or another. No employe is obliged to join or contribute to the mortuary fund but it is extremely important to his own good interests to do so. This fund is created and maintained out of regular 25-cent contributions from the members upon the death of any employe. At present it is possible to hand $1,000 in cash within 24 hours to the widow or family of any employe dying in the service. Almost no old line insurance policies are paid within 30 or 60 days after death, and immediate cash is what the family needs when the father dies. The mortuary fund provides the money.

The Pacific Electric group insurance is similar to that form of protection enjoyed by employes of other companies. The company in this case pays a part of the premium and adds $250, free, if the employe has worked six months or a year, and $500 if he has been in the service more than a year. Even if an employe does not take out the insurance to which he is entitled according to his salary he still has the free policy.

An educational department attached to the club is doing a very fine work. The educational advisor, a professor in the University of Southern California, gives individual attention to any man wishing it, gives him the proper studies, and directs him to the right kind of night school. Thereafter this advisor keeps a check on the student, knows whether he is going to a night school or taking a correspondence course, which seems to be a very popular form of improvement among the better class of employes, and just what he is doing to improve himself. There is a class in business English which, goodness knows, is a very fine feature itself; a class for beginners and advanced students in stenographic work; another studying freight traffic, and a half dozen or more special classes with teachers in other subjects. Indeed, the educational section alone is worth more than the cost of keeping up the organization.

All divisions of the Pacific Electric have train masters' meeting about once a month. There are agents' meetings, safety meetings from all the divisions, meetings of the mechanical department, the electrical engineers, and so on. There is a rod and gun club, a very large one too, with a room for its own purposes in the club rooms, and private shooting grounds at Los Cerritos on the Newport line of Pacific Electric.

On the Pacific Electric, employes who have been in the service a year or more are allowed 12 days' vacation every year between June 1 and September 30 at full pay. This vacation they may spend if they wish in the club's camp at Lake Arrowhead in the San Bernardino mountains, where it is possible to get a furnished cottage, and supplies sold to them at cost. Men who have been about the world a good deal say this is one of the finest camps owned anywhere by an industrial organization. There are free amusements, boats, a launch, a free automobile, and to make it even more available, transportation through to the camp will be provided free this year for employes and their families, whereas in the past such transportation was good only to San Bernardino. Large improvements are contemplated at this camp for the next season.

At the rooms in East Eighth street two floors are given over entirely to the club's activities. The second floor above the street is the auditorium used for meetings and dances, with stage accessories for vaudeville. The third floor is used for offices of the club, billiards, library, rod and gun club, and private reading and rest rooms for the women guests.

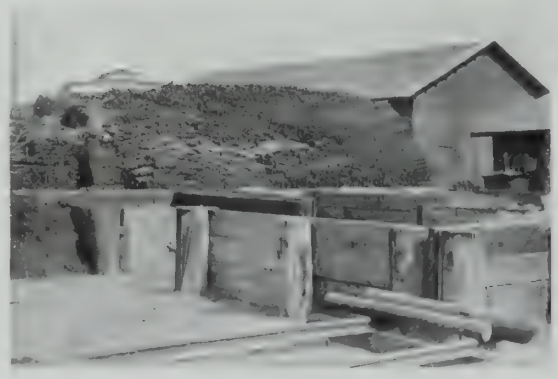
Billiard Room in the Pacific Electric Club.

Saving Millions in Junk Plants

Lost Spike Story Out of Date

By Oliver Welles

JUNK is a gilt edge security today. It can not be blown away or burned, and no flood sweeps it beyond redemption. It has a constant market value. A national association with headquarters in Philadelphia and agents everywhere issue daily bulletins about it. Men bid eagerly against one another for the junk to be taken from buildings about to be torn down, or in the salvage of those destroyed by fire or flood. Loud voiced and keen witted foreigners who drove decrepit wagons and knock-kneed horses through the alleys only a few years ago, pleading eagerly for old iron of any kind, will be found in many large cities, with bank credit worth very large amounts, while others of their countrymen keep up the endless search all over the land for odds and ends of this and that and the other thing classed as junk.



Reclaiming Old Rubber Air Hose Through New Methods in the Sacramento Shops

No country in the world, it has been said, was, until only a few years ago, so wasteful as this great country of ours. To some extent this condition still exists, but some of the nation's brainiest men are striving to wipe it out. This waste applied, of course, to many things besides iron and the other metals. I am concerned chiefly, in this article, with the junk of railroads, an industry which, until comparatively a short time ago, was a grevious offender in respect to waste. The old story about the general manager—sometimes it is the president — who found the rail spike while inspecting the sectionmen's work, is well known. I refer to it here only because it no longer applies truthfully to any section. Spikes, like all other railroad material, have a definite and very important value which the pioneer railroad builders did not always realize. The section foreman who permitted waste of this kind now on the right of way in his care would soon be hunting another job.

Sorting the Scrap Metals in the Sacramento Reclamation Plant; the Men Are Said to be Experts

All over the land the railroads, in common with other great industries seeking eagerly for a net return, are saving and reclaiming and making over everything bought and used in the properties. A man now holding a high position on an eastern railroad attracted his superiors' attention a few years ago while acting as a storekeeper by saving twine and old paper. These and other materials, ordinarily wasted, are gathered on that road today in carloads and sold for very dignified amounts of much needed money.

One of the largest plants in the West for reclaiming old and discarded materials is owned by the Southern Pacific Co., at Sacramento. In this plant, as in hundreds, probably, cast iron is melted and recast, iron and steel parts are sorted and classified and accounted for. Even the old rubber air hose is salvaged. For years no market could be found for this hose because it contained wire in its structure; but now a method has been found for separating the two, and both are used or sold.

Scrap is received at the Sacramento scrap dock daily, and with the aid of a high-power magnet is unloaded from the cars to a large platform where it is sorted out for distribution to the various reclaiming shops. Scrap intended for the

rolling mill is taken to the piling shed, where it is put into piles varying from 160 pounds to 380 pounds, after which it is transferred to the rolling mill storage yard ready for heating and rolling into the various products.

A large part of the material reclaimed at Sacramento is shipped to points throughout the Pacific system of the Southern Pacific, but the greater part is used at the Sacramento shops in the manufacture of all kinds of bolts, nuts, car, locomotive, steamboat, maintenance of way, and other forgings necessary to repair and build railroad equipment. In doing this work, the rolling mill operates two 12-inch and two 18-inch mills using eight 3-door and eight 2-door reverberatory furnaces. Some of these furnaces are used to heat the iron for one 5000-pound, one 4000-pound and two 3600-pound steam hammers which assist in preparing the iron for its ultimate use. In addition to these hammers a number of small hammers are scattered throughout the plant and the blacksmith shop for working up the forgings.

In addition to merchant bar iron, these shops get out all sizes up to 3 inches square and round and 1⅝ by 9 inches, and flats as wide as 9 inches. They also get out a great many patterns of angle bars and fish plates for rail in the Southern Pacific track, and a large number of tie plates.

Torches are used in cutting up the scrap at the reclamation plant. There are nine torch outlets where hose can be attached, each outlet being protected by four steel rails bent into the form of a pyramid. This is done to keep pieces of metal and other objects from striking the outlets and possibly breaking or bending them. When the operator is using the cutting torch at some distance from the outlet the hose is carried overhead on metal poles so that it is never in the way of the workmen, and does not become punctured by heavy objects falling on it.

Some of the men working at the scrap docks have been with the company for many years, and are experts in classifying the articles they find, whether they are malleable or cast iron, or rolled or forged steel. Special scrap-sorting tables are rigged up at the reclamation plant for avoiding the necessity of the men's stooping over when doing the work. The planks on the table are loose, and are removed as fast as the scrap is worked out, keeping the sorters close to the material all the time.

In order to reclaim various materials and articles cheaply and quickly, engineers of the company have devised special machinery, frequently using old machinery, itself salvaged, which has been remodeled to meet special requirements. Track spikes in need of straightening are handled through an oil furnace by gravity. While hot these spikes are dropped into a home - made spike - straightening press. If the heads are out of alignment a light blow with the air hammer is given them. The press is double-acting so that the instant the finished spike is released the center block starts compressing the spike just dropped into place on the opposite side, thereby saving compressed air and increasing production.

Thousands of dollars worth of metals and other materials are saved every year to justify the plant's existence. Nothing, nowdays, ever is thrown away. As in the great meat packing plants where it is said everything except the squeal is saved, everything in the railroad reclamation plant except the squeak is reclaimed, made over, used again. The day of wastefulness has passed.

Scrap tires are reduced to charging box size by cutting torch. The billets are heated and hammered out under steam hammer and by the use of swage tools are made into heel and toe end of claw bars. Tire steel is also used in the manufacture of lining bars, repointing of track picks, and various other purposes. Shovels with broken handles are re-handled and broken shovel blades are welded by oxy-acetylene. The cost of these latter repairs is 54 per cent the cost of new. Shovels with broken handles and worn blades are made over into stove shovels. Scrapped coil springs are reclaimed by heating in a furnace, pulled out straight by compressed air machine, straightened under a steam hammer, and made into buggy, jack and pinch bars.

Klinger type water glasses, when so badly worn down as to permit leaking, which have heretofore been considered scrap, are reclaimed by placing the glasses in holders of motor - driven, shop - made, grinding machines, with oscillating movement. Six glasses are ground at one operation. After grinding they are cleaned in distillate. Glasses are reclaimed for 11 cents.

Strainer boxes used between locomotive and tender, discarded on account of worn or battered threads are again made serviceable by removing old threads by machine, building up by oxy-welding process and threading. The result is a strainer box as good as new for 35 per cent of the article's original cost.

Broken monkey wrenches are made serviceable by building up with brass, oxy-weld process, effecting a saving on broken parts which otherwise would be scrap.

A machine has been devised for stripping dry cells. The zinc and brass removed are sold for scrap, and the wax is made into sealing wax. While the saving in this instance is not large, it more than pays for labor and other costs, and keeps the right-of-way clear of such rubbish. There is no market for scrap wire-inserted hose, so by removing the wire insertion with a shop-made machine the wire and hose separate are marketable as scrap.

Couplers condemned on account of worn shanks are again returned to service by removing the worn part of the shank with a cut-

ting torch, and a piece of scrap boiler plate is welded in place. There is an average saving of 22 per cent of the cost of new. When repaired, each coupler is stamped with the initial of the mechanic doing the work, also date and shop.

Badly battered or cracked joints are made serviceable by means of oxy-acetylene process, and their use for spur or secondary tracks has proved highly satisfactory.

Oxy-acetylene building-up process has been responsible for the Southern Pacific's reclaiming thousands of switch points at an average cost of 40 per cent of the new value, and there have been no failures. Switch points broken up to 10 inches are built up. Traveling frog gangs build up battered or chipped ends of rails without having to disconnect the rail.

Many hand lanterns received from the line look like scrap, but by straightening out the boxes and frames, cleaning in hot lye vat, giving acid bath and retinning they can be returned to service.

A machine has been built for straightening bolts, having been salvaged from a scrap wheel press, and converted into a motor driven machine with necessary dies. This machine straightens all bent bolts and rods of the larger size.

Gas Cheaper Than Acetylene

The Western Pacific Railroad started to use city gas in its Sacramento shops in June, 1923. At that time only small appliances, such as soldering furnaces and hand preheating torches, were installed. Later, city gas was used for metal cutting along with oxygen. City gas is cheaper than acetylene. Another advantage in using it is the fact that when the cutting is completed the article may be put into a lathe or shaper, and machined without any danger of dulling the cutting tools. Using acetylene and oxygen, the material cut retains a semi-case-hardened surface approximately fifteen thousandths of an inch in thickness which will dull the cutting tools used in machining.

Gas may be piped to any part of the shops; it is always ready. It is not necessary to buy steel containers, and the labor and transportation involved are avoided.

Gas-fired, portable rivet forges were installed, replacing the old coal-fired forges, eliminating smoke and stopping the loss of rivets through overheating, as well as cutting the scale formation to a minimum.

Small Furnace Heated with City Gas Formerly Operated with Fuel Oil

The next installations were a spring furnace and a carbonizing furnace. These furnaces are about the same size 56 by 36 by 16 inches. To the present time the lining in the spring furnace has never been touched, although it has been in daily operation since 1923, when it was converted from oil to gas. With gas, wear and tear on furnace linings is avoided and costly shutdowns and repairs are prevented. With controlled furnace atmosphere there is no scale, and no danger of a back-fire.

Two flue heating furnaces were installed later and used for heating the flue ends prior to cutting with a circular saw. City gas replaced kerosene as fuel for heating the flues.

A gas fired ring-burner for heating locomotive tires is used in place of one which formerly used gasoline or kerosene. The advantages of city gas in this operation are that it leaves the tires free of soot, is faster in operation and, above all, declared to be absolutely safe.

During the latter part of 1925 a big plate-annealing furnace was converted from oil to city gas. This furnace is 10 by 14 by 3 ft. Formerly six oil burners were used in this furnace. These were replaced by six high-pressure gas burners. Before using gas much metal was lost due to scale on the plates, as a result of the oxidizing action of the oil air atmosphere of the furnace. Now this scale loss is reduced to a minimum. The plates are softer, which makes it possible for them to be worked much easier. The furnace requires about one hour and fifteen minutes to reach the operating temperature. After this temperature is reached plates may be annealed at the rate of one every twelve to fifteen minutes. There is no difficulty in starting the cold furnace. Using city gas, it is only a matter of two or three minutes until all burners are lighted and operating perfectly.

The latest installations of gas-fired equipment are two furnaces formerly operated with oil. These are a bull-dozer furnace and a rod-annealing furnace. The bull-dozer is used for heating all kinds of small forgings, while the rod-annealing furnace is used for side rods, main rods, drawbars, driving boxes, drawbar equalizers, and other miscellaneous parts. The furnaces are giving good results.

Fourteen Acres of Oil Storage

An oil storage reservoir, said to be the largest project of the kind ever built by a railroad company, has been constructed for the South-

Oil Reservoir of the Southern Pacific Co., at Tracy, Calif., Said to Be the Largest of Its Kind.

ern Pacific Co. at Tracy, Calif. The reservoir has a capacity of three million barrels, and is intended to hold a reserve supply for the company's oil burning equipment. It is strategically situated both as to source of supply and convenient shipping facilities. Within half a mile are the pipe lines of two of the state's largest oil companies, both of which have filling lines connected with those of the company. The same lines are to be utilized for delivery to the railroad's tank car loading rack near Tracy.

Fourteen acres of roof cover the reservoir. The entire structure, including embankment, occupies nearly 19 acres. The length inside the floor is 1,085 feet and the width 490 feet, while the depth is 31 feet.

The design and construction work were under the general supervision of W. H. Kirdbride, engineer, maintenance of way and structures, J. M. Evans, construction engineer in charge of the work, and Bent Bros., the contractors. The contractors' forces worked night and day. For night work the area was illuminated with powerful electric flood lights.

The Uses Of Compressed Air

Compressed air is put to many uses by the Southern Pacific in the coach yard, Third street station, San Francisco. At the station end of the tracks is equipment for testing the passenger train line and charging it with air before the engine is connected. In addition to this test, there is a portable testing device equipped with a diaphragm and two gauges and an engineer's testing valve. This equipment is carried on a two-wheel hand truck, and can easily be moved to any place in the yard. A number of these devices were built in the Southern Pacific shops and are giving valuable service in detecting trouble in the air lines before the car is taken to the station. The device has a small steel air reservoir and two long air hose, one of which is connected to the compressed air line, extending throughout the yard. The other is connected to the train line. The diaphragm on the testing device permits the air to enter the train and triple valves slowly, exactly as when the engineer tests the line from his locomotive cab, as the device is equipped with an engineer's testing valve.

There is also a special device for testing air hose, retainer and release valves. This also is equipped with a diaphragm and a special gauge with two indicators, one showing the pressure on the train air line and the other showing the pressure used in the test. There is a special portable device for testing the air equipment of freight cars standing in the yard, which is equipped with a diaphragm air

This Shows How the Roof Over the Oil Reservoir is Supported by Steel Construction.

Air Whistle in Repair Yards.

gauge and two air hose, one for connecting to the air line on the freight car.

Compressed air is used extensively in cleaning passenger and Pullman cars. For cleaning passenger cars a device attached to a metal tripod is placed on the ground just outside the coach. This is provided with a "Y" shaped pipe, the compressed air passing through this "Y" and out through a straight piece of pipe about 14 inches long which makes a siphon out of a length of hose extending through the coach window. On the other end of this hose is a regular vacuum cleaning appliance which is placed against the seats, the dust from the seats being sucked up and passed out through the 14 inch pipe on the tripod, the apparatus converting the compressed air into a vacuum cleaner.

A Compressed Air Jack Is Used in Changing Car Wheels

A Portable Testing Device.

Compressed air is used also in cleaning carpets. Strips are laid on a floor consisting of a series of slats. Then a vacuum machine is run over the carpet.

The yards extend for about four blocks. In the center of the yards a whistle has been installed and operated by compressed air and used in calling the various department heads.

A novel method is employed by the store department of the Southern Pacific at the general shops in Sacramento in laying out link chain to increase the speed in counting of stock, and at the same time provide an orderly method of arrangement. All the lengths of chain are provided with tags giving the number of feet, thus enabling the monthly stock record to be taken quickly and easily. The wooden platform on which the chain is stored is raised a little above the ground, and is 30 feet long. The chain is coated with an anti-rust solution.

Changing Wheels With Speed

In the yards of the Third street passenger station of the Southern Pacific in San Francisco a compressed air jack is used in removing wheels from passenger coaches, and applying new wheels, which

Rack for Cleaning Carpets With Compressed Air.

makes it unnecessary for a coach to be taken to the Bay Shore shops five miles away.

The car is spotted over a concrete pit, and the weight taken off the truck by jacks. A jack operated by compressed air is mounted on flanged wheels which in turn travel on rails in the bottom of the concrete pit which extends at right angles to the railroad tracks. The air jack is moved to a point directly under the axle to be removed, and is then brought up until it engages the axle. When the jack has raised the wheels clear of the track, two short sections extending across the concrete pit are removed and the jack is then lowered, carrying the wheels and axle below the top of the pit. The jack and the wheels are then wheeled to the right or left, and

How the Compressed Air Jack Operates

raised and the wheels run onto the track where scrap wheels are stored. A good pair of wheels is then placed on the air jack which are moved to the proper position under the truck and raised into position in the truck. The entire operation has been performed by three men in 40 minutes.

An Important Work to Do

Ivan Daugherty.

The dignity of labor is no empty phrase. We tire sometimes of the cheer-up patter but, after all, the chap who likes his work, and believes it to be a very important part of the product he is helping to make is more likely than any other to get ahead in the world. "A competent section foreman," said Louis W. Hill, chairman of the Great Northern board of directors, "often is as important an asset as the president, and sometimes more so." A railroad isn't run by one man. It takes many.

Ivan Daugherty is a coach cleaner for the Union Pacific at La Grande, Ore. This doesn't seem very thrilling until you read what Ivan says about it in his letter to the company magazine. And then you decide that one of these fine days this man is likely to have another job. Chairman Markham of the Illinois Central R. R. was a section hand in the beginning.

"In cleaning coaches, "says Ivan Daugherty, "we make it a point to be neat and clean in our personal appearance and, when working in trains enroute, to be governed by the rule that requires all men sweeping, icing and watering coaches to wear clean white suits. This makes a better appearance before the public. In cleaning day coaches en route, we are careful to avoid annoying the passengers with dust. We do not use a feather duster on the walls, windows and seats, but rather a clean dust cloth dampened with Brook's renovating oil, which is standard for this work.

"We take special notice of the condition of drinking cup containers and drinking water, noting that the containers are filled and that the water is clean, tasteful and cool. All soiled papers and waste paper are removed from parcel racks and seats. Soiled drinking cups are removed from the containers installed for that purpose. Last, but not least, we endeavor to be courteous and kindly disposed and helpful, as needed, with all patrons with whom we come in contact, and to give any information we can furnish if called upon.

"When coaches are to be cleaned and stored, we remove all floor mats and aisle strips, dust all window sills, sashes, seats, and seat arms with oiled dust cloth, as already mentioned, and sweep floors with wet sawdust, after which they are mopped clean, and mats and aisle strips replaced.

"Lights in coaches are given the necessary inspection and globes cleaned and polished. Windows inside and out are thoroughly cleaned and dried. Vestibules likewise are cleaned thoroughly, and the vestibule woodwork wiped down with oil-dampened dust cloth. Outside of coach receives the same care to make its appearance neat and shiny.

"In conclusion I should say that a coach cleaner must be a finished and thorough workman to get good results."

What do you think of that, Mr. Gray?

The Oregon Trunk Accepts

The Oregon Trunk Ry. has filed with the Interstate Commerce Commission its acceptance of the commission's conditions for extending its lines to Klamath Falls, Ore.

Under these conditions, actual construction must start by July 10 on the extension of trackage from Bend to Klamath Falls, which is in the heart of an important lumbering district.

The Oregon Trunk is owned jointly by Great Northern and Northern Pacific railways. Recently the latter decided against participation in the proposed new construction under the then prevailing terms.

Inspection Trip In Comfort

An inspection trip, protected from the weather and wind is provided in the observation booth on the front of the locomotive used for the purpose by the Colorado & Southern Ry. This booth is built

Inspectors and the Engine Driver Occupy the Observation Booth.

so that observers may ride close to the rails. The controls are in the cage, the engineer riding with the officers, the fireman keeping his usual station. Several men may ride comfortably on the long seat extending across the cage.

Will Do Their Share

American railroads today are the best managed and give the best service of any in the world. If they can be protected from the wild-eyed socialists who occasionally get a foothold in state and national halls of legislation they will continue to be the arteries of business and make money for investor and employe.

Let the railroads alone and they will do their share toward advancing the prosperity of the country.—Scranton (Pa) Scrantonian.

Queer Things That Happened In May

Odds and Ends of News

A Monthly Symposium

WHAT an interesting world it is, and what wonderful things the people do! At Lincoln, Neb., early in May, a "manless" tractor, controlled by an electric device, plowed a field successfully before a crowd of farmers, professors of agriculture and business men.

Unguided by human hand, the machine was equipped with an automatic guide invented by F. L. Zibach of Grand Island, Neb.

The tractor runs in an irregular circle, rounding the corners. Except for replenishing the gasoline and oil, it needs no attention. The electric controls stop the machine should it leave the furrow and when the work is completed.

A cable from Paris informed a pop-eyed world the French government is convinced of the practicability of a new synthetic motor fuel developed by French engineers.

The new fuel is looked on as of great importance to France, particularly in war time, in view of the possibility of gasoline supply being cut off by the enemy. The fuel is a specially prepared wood and charcoal mixture for automobiles, trucks and farm traction engines.

Seated at his desk in Washington, one day, William P. McCracken, assistant secretary of commerce for aeronautics, spoke by telephone with occupants of an airplane flying high above the earth miles away.

When, after a few minutes of conversation, an electric storm suddenly engulfed the city, Mr. McCracken warned the flyers of the weather's latest turn and advised that they return to Bolling Field, illustrating, he said, the primary purpose of this means of communication, "to give advance information to airplanes in flight."

A report filed at the sheriff's office revealed the theft from the manufacturing district of Vernon, Calif., of $20,000 worth of locomotive parts, which were hauled away by the thieves with trucks. The parts were castings enough to build a locomotive.

The Seismological Society of America, in session at Cambridge, Mass., considered types of structures best fitted to resist earthquakes. Prof. Charles M. Spofford, head of the department of civil engineering of the Massachusetts Institute of Technology, declared the termendous loss of life in recent years could largely have been prevented by proper engineering practice.

The steel framed buildings of lower Broadway would be as safe in an earthquake as would the Leviathan in a storm at sea, if wall, floors and partitions were to be made of steel plates as is the ship, or of reinforced concrete, he declared.

As a result of a survey of ruins of Messina in Sicily, Kingston in Jamaica, Santa Barbara in California, and Cargago in Costa Rica, Prof. Spofford found that no building constructed entirely of material with a low tensile resistance or little elasticity was safe against severe shock. This applied to adobe, ordinary brick work laid in lime mortar, and lime mortar rubble.

General elasticity, continuity and lightness of structures were of more importance than thickness of walls or low height, he declared.

Prof. Spofford advocated automatic devices to cut off gas and electricity at the instant of shock.

Prof. Charles U. Brown of Brown University declared that while hitherto earthquakes have been studied through their effects in a sort of "posthumous" record, the value should not be overlooked of an anticipatory gathering of all geological, geophysical and engineering data that might serve as an appropriate basis for evaluating structures, their types, character, location and possible insurance in terms of earthquake liability.

Charles L. Henry, 77 years of age, "father" of the electric railway in Indiana and declared to be the coiner of the word "interurban," died at his home in Indianapolis after an illness of more than two months. He was president and receiver of the Indianapolis-Cincinnati Traction Co.

There is owned and operated by the Class 1 railroads of the country one freight car for every 45 inhabitants of the United States. Last year 2,518,429 freight and refrigerator cars of all types each averaged 11,108 miles of travel. Each carried the equivalent of 194,001 tons one mile, and, when loaded, carried an average of 27.4 tons per trip. If only loaded trips are counted, each car moved approximately 304,359 tons one mile during 1926. The Class 1 railroads now own or operate more than 10.7 freight cars to every mile of road.

For carrying the average ton one mile last year the railroads received 1.08 cents. An aggregate

of 53,310,000 cars were loaded during 1926, and $210,000,000 was invested in new freight cars.

Shorter skirts, plus a great increase in travel conveniences, have lightened the job of the baggageman. The average piece of baggage checked now weighs less than the baggage ten years ago. People are becoming more experienced travelers and they no longer carry with them the vast assortment of clothing and nick-nacks once considered essentials. Men traveling on the limited trains may have their suit pressed while they sleep. Women's dresses, because of the styles and light materials, require less packing space than in years past.

More bells than the mission fathers ever dreamed of importing from Spain are essential to running a railroad. These bells range in size from massive 170-pound locomotive bells down to tiny bells in adding machines and typewriters.

Bells are employed by the company to announce the time aboard its ships, to warn of danger at grade crossings, to start engines turning on sea-going vessels and ferry steamers, to start or stop electric trains, as fire alarms, fog bells on ferry slips and for countless other useful purposes.

Loading of citrus fruits has been expedited 300 per cent by a spiral gravity loader, designed by the Banning Company stevedores, used for the first time with great success in the loading of 30,000 cases of oranges aboard the Royal Mail motor liner Lochmonar, in Los Angeles harbor. With the new system, an average of 1250 cases of oranges were loaded per hour, as against the previous high record of 500 cases per hour, with the use of ship's gear.

The new device is similar in design to the spiral fire escape, or slide. Cases of fruit are carried to the top of the slide by an ordinary endless track and then are carried down to the proper level of the ship's hold by gravity on the spiral slide, which is constructed in sections which may be added or removed according to the depth of the hold.

This one is worth remembering. In a decision upholding the right of states to enact and administer laws against criminal syndicalism the United States Supreme Court said this:

> The freedom of speech which is secured by the Constitution does not confer an absolute right to speak, without responsibility, whatever one may choose, or an unrestricted and unbridled license giving immunity for every possible use of language and preventing the punishment of those who abuse this freedom, and that a state in the exercise of its police power may punish those who abuse this freedom by utterances inimical to the public welfare, tending to incite to crime, disturb the public peace or endanger the foundations of organized government and threaten its overthrow by unlawful means, is not an open question.

One-Man Car on Mt. Lowe.

Inspecting Mt. Lowe's Cable

The cable which pulls cars up the incline railway to Mt. Lowe is inspected every week, and a new one installed every year. The illustration, from a photograph supplied by the Pacific Electric Ry., shows the inspector riding down the incline on a little car whose brakes are applied by his feet.

It is characteristic of the average public indifference that few persons perhaps ever think of the great care and constant attention given to safety by track men and operating officials. This is the outstanding feature of the Mt. Lowe incline railway, and the result is shown in the record. Not one accident has occurred on that line in the 38 years of its existence. The Mt. Lowe incline railway operates on a 62 per cent grade. Although the steel cable is tested to a 100-ton capacity, it never is loaded beyond a 5-ton limit.

Wisconsin Increases Taxes

Taxes totalling $6,613,639 have been levied on the 32 railroads of Wisconsin this year, an increase of $127,341 over the amount levied last year. The figures show the railroads were valued at $347,202,000 in 1926, while the valuation this year has been placed at $350,596,000. The total railroad tax last year amounted to $6,485,288.

Increased valuations were given to a number of roads. With an unchanged valuation of $83,000,000 the Chicago, Milwaukee & St. Paul will pay $1,563,771.

The valuation of the C. & N. W. road has jumped from $118,000,000 to $119,000,000, with the tax this year amounting to $2,244,814, the largest tax to be paid by any of the roads.

The Soo line, with a valuation of $55,000,000, will pay a tax of $1,037,519.

Other large railroad taxpayers will be: Chicago, Burlington & Quincy, $452,735, Chicago, St. Paul, Minneapolis & Omaha, $650,807; Great Northern, $245,231.

The Tie That Bribes

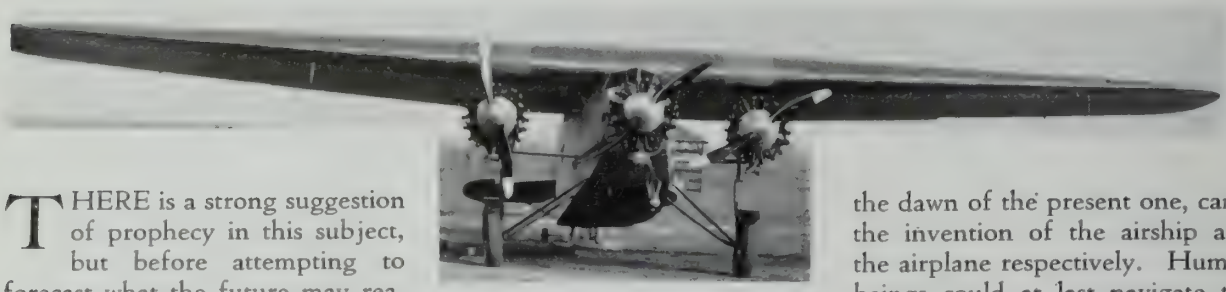
Mariana Cabrera, manager of the National Railways of Mexico, declares in El Universal today he has discovered frauds of millions of pesos by contractors furnishing ties. The contractors, Cabrero asserts, bribed railroad employes to remove new ties, replacing them with old ones, and the contractors then have resold the ties to the railroad. The practice, Cabrera says, has been going on for a long time.

Air Freight to South America?

Possibilities of the Future

By William P. MacCracken, Jr.

Asst. Secy. of Commerce for Aeronautics



—P & A Photo.

Commander Byrd's Tri-motored Fokker Monoplane.

THERE is a strong suggestion of prophecy in this subject, but before attempting to forecast what the future may reasonably be expected to bring forth in the application of aircraft to inter-American trade, let me direct your thoughts to business conditions as they existed in this hemisphere a century ago, with a view to comparing them to present day conditions.

Merchants and manufacturers then were dependent entirely upon sailing vessels, animal drawn canal boats, horses, oxen, and kindred beasts of burden for transporting articles of commerce. The largest city in this hemisphere had a population of less than 200,000 and the total population probably did not exceed 40,000,000, while the per capita wealth was probably about $100.

The passing of these one hundred years first witnessed the utilization of steam and internal combustion engines in both land and water transportation. Today we have 56 cities of over 200,000 population, and a total population in excess of 200,000,000. Not only has the population increased five fold, but the per capita wealth has increased eight fold.

This has been made possible in no small measure by these improved methods of transportation. It is true that all parts of these continents have not progressed equally, and various reasons may be given in explanation of this, but in each instance, one of the underlying causes has been the availability, or lack of, good transportation facilities. Without transportation there can be no extensive exchange of goods, knowledge, or wealth.

For centuries mankind stood upon the earth and envied the birds as they winged their way over land and sea with speed and ease, far excelling anything he, with all his inventive genius and reasoning powers, could do. With the close of the last century, and the dawn of the present one, came the invention of the airship and the airplane respectively. Human beings could at last navigate the air. However, little application of aeronautics to the needs of commerce was achieved until after the close of the World War.

—Wide World Photo.

Shipping Pianos from New York to Washington by Airplane.

During the period from 1914 to 1918 marked progress was made in perfecting the use of aircraft as implements of war. At the close of their conflicts, the ancient peoples turned their crude war weapons into plowshares and other implements of husbandry. We of this generation turned our attention to converting military aircraft into vehicles of commerce. Great progress toward this end has been made during the eight and one half years since hostilities ceased on the western front in Europe, and we are still upon the threshold of endless possibilities. This hemisphere offers opportunities equal to, if not exceeding, those which exist in any other part of the world.

In the Americas distances are great. Vast areas remain undeveloped, long mountain ranges constitute serious barriers to surface transportation, national boundaries are extensive, and, in a large measure, unprotected. The urge of the pioneer still actuates our peoples, and the spirit of good will and mutual helpfulness prevails.

With the growth of commerce comes the demand for more and better transportation facilities.

—An address before the Pan American Commercial Aviation Conference, Washington, May 5.

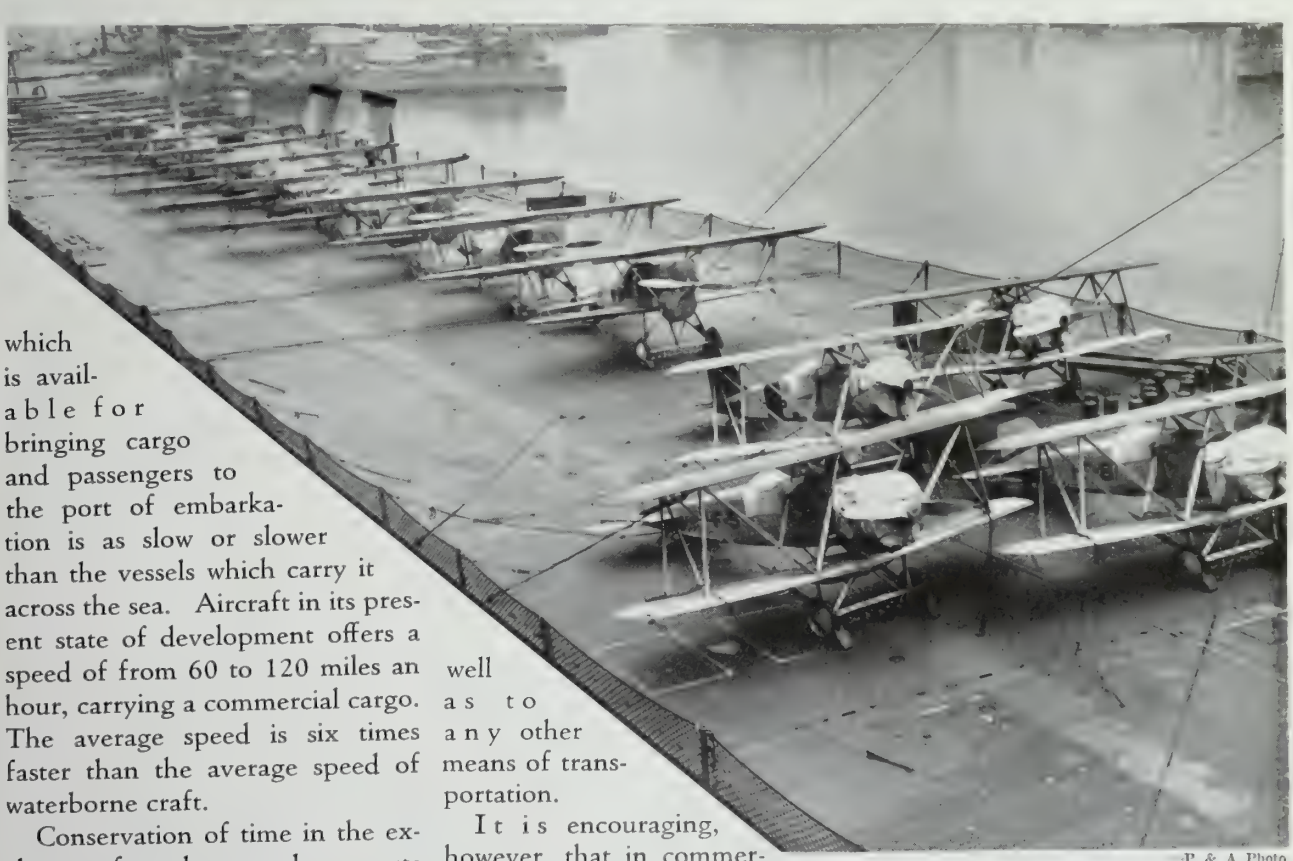
There are no railroads or highways now that connect even a majority of the nations here represented, and while such projects have been proposed, and may eventually be realized, the bulk of this great trade between the nations of this hemisphere must be transported for a large portion of its journey by watercraft, traveling at from nine to 20 miles an hour. In many instances, land transportation, which is available for bringing cargo and passengers to the port of embarkation is as slow or slower than the vessels which carry it across the sea. Aircraft in its present state of development offers a speed of from 60 to 120 miles an hour, carrying a commercial cargo. The average speed is six times faster than the average speed of waterborne craft.

Conservation of time in the exchange of goods means lower costs and broader markets. It reduces interest charges, expedites turnovers, stabilizes prices, decreases the period of insurance coverage, lessens spoilage and shrinkage, and relieves the merchants from carrying large stocks of goods on hand. Not only does aircraft offer this great economy in time, but it avoids costly transfers from one medium of transportation to another. Not every community can have a harbor, and some are practically inaccessible even to railroads, but airports may be established within a comparatively short distance of any place where men can live and work.

Some of you may think—"true, air travel saves time, but it is very dangerous." In this connection, I remind you that every method of transportation presents elements of risk. Countless lives and tons of cargo have been lost at sea. Railroads and automobiles have taken their toll, and even walking to-day presents certain dangers. You always will be able to find accident statistics relating to aeronautics, as well as to any other means of transportation.

It is encouraging, however, that in commercial operations, these are showing a marked reduction. Formerly fatalities were estimated in hundreds of thousand miles of flight. To-day they are estimated in millions of miles. There are several operating companies with considerable experience that have not injured one passenger or damaged a pound of cargo. Insurance companies are taking cognizance of this improvement in the safety records of aircraft, and are offering broader coverages at reduced premiums. In fact, in certain instances insurance may be obtained at lower rates where goods are transported by air than where they are transported by rail and water. Air navigation to-day is relatively safe and, as the art progresses, is being made safer.

In addition to the advantages of speed and safety there are many instances in this hemisphere where air transport operations may be established and operated at lower cost than any other means of transportation, and even where railroads already exist there are certain types of cargo and a sufficient number of people available able and willing to pay a premium for speed, which will make air transport self-supporting and profitable.



P & A Photo

Upper Deck of Navy Airplane Carrier Langley.

The only air lines in the world that are making a profit without government subsidy are to be found on the American continents. While these lines are relatively few in number, their records, with those of other lines which are not yet on a profitable basis, indicate conclusively that, in the Americas, air transport will render an economic service of sufficient value to pay a fair return upon the capital invested.

There are 13,059 miles of air-

ways in operation in this hemisphere and many more are contracted for or projected, but only 2,906 miles are used in inter-American commerce, the others are wholly within the territory of one nation. In order that international air navigation may develop, it is necessary that the members of the Pan American Union should come to some agreement, which will form the basis for permitting commercial aircraft to fly from one state to another.

Realizing the necessity for this, the delegates to the fifth International Conference of American States held at Santiago, Chile in 1923, authorized the governing board of the Pan American Union to call a meeting of the Inter-American Commercial Aviation Commission. It is by reason of their action in so doing that these joint sessions of the commission and of the Third Pan American Commercial Conference were made possible. After the conference adjourns, the commission will set itself to the task of formulating a convention which will be the cornerstone of inter-American air commerce. Such an agreement should be as simple as possible, and as broad as may be consistent with the sovereignty of our respective nations. With such an agreement in effect, air commerce between the nations of this great hemisphere should expand with rapidity and bring with it, not only prosperity, but a better understanding among our peoples.

Ranchers Buy Airplanes

"Half a billion dollars has been invested in the aircraft industry. This is being added to at a rapid rate, aircraft schools alone adding 1 per cent a month to capital employed. This money comes generally from the most conservative elements in the country, and the names appearing on the boards of directors of the aircraft factories are those of successful and cautious investors. Dividends are being paid in the United States, while outside the United States only two unsubsidized commercial air lines are in existence, and neither of them is in mainland European countries, though controlled by European capital. Five individual planes, according to the fiscal records of 1925-26, are sold in the United States every time one such plane is sold in France, England, Germany and Japan combined. Over 6,000 commercial aircraft were constructed in the United States in that period, and, if Soviet Russia be omitted, the United States licensed more new pilots than any two nations combined. Soviet Russia trained more new pilots than any European nation, according to official statements. In the fiscal year the municipalities of the United States expended more than $4,000,000 for municipal and other air ports — more than was expended on air ports in all the previous history of aviation.

"The safety of American aeronautics was emphasized by the remarkable fact that during the fiscal year not one fatality occurred on any American passenger aircraft line operating under regular organized procedure—a record never equaled by any European nation with subsidized air lines. At the same time, in place of federal aircraft inspection, municipalities possessing air ports instituted their own air boards for the regulation of local flying, these boards issuing permits for flight only to planes passing their inspection. The members are in practically all cases pilots with practical flying experience.

"In a single week in September more than 50 per cent of the civil airplane orders in four western states were from residents of ranches. On July 4, 1926, Prescott, Ariz., threw its traditional patriotic celebrations to the winds, and its rodeo was an aircraft event.

"The national airways are designedly drawn over the best tilled land and grazing courses in the country. Flying over these airways the writer has recently observed hundreds of private aircraft tied up in fence corners, pastures, meadows and lanes, near farmhouses and barns, being obviously the property of the farmers and their hired help. At Prescott, Omaha, Los Angeles, a large part of the total air traffic each day is furnished by these dust-clouded planes coming from ranches and farms for supplies and on 'bucko hops,' as the ranchers refer to their courting activities by airplane. The United States does not at the present time know actually how strong it is in the air, for airplanes are being used by countless young ranchers and farmers who have been taught by friends, and have never bothered about licenses."—Current History.

Northwest Passenger Service Now

The Pacific Air Transport estabtablished regular passenger-cabin airplane service between Portland and Seattle and announced excursion rates, May 20.

Fokker planes capable of carrying four passengers and air mail will be used.

N. B. Evans, traffic manager of Pacific Air Transport, in announcing the service, said the company will offer for 30 days a special fare of $12 one way and round trip $20.

"We want to give the public an opportunity to try air transportation in cabin planes so that the people may learn the comforts and advantages of this kind of air travel," he said. "These fares are the lowest ever established anywhere in the world."

In Five Years Trans-ocean Service

Anthony Fokker believes that in five years Paris-New York flying would be on a commercial basis. "I think the great circle course will be followed by these commercial planes," he said, "and there will be stops at Newfoundland, at Ire-

land, and at London on the way. The whole trip should not take more than 36 hours, as by that time engines will have been improved and ordinary speed raised to 150 miles an hour."

Fokker revealed that the cost of operating the Byrd-Noville-Acosta three-engined America at present is 60 cents per mile per man, or $1.80 a mile with the present crew. On the basis of these figures the flight to Paris over a course of approximately 3500 miles will cost a little more than $6000.

The veteran airplane man estimated that by the time commercial lines are operating across the ocean this cost can be cut to 25 cents per mile per man. This will be done in part, he said, by having room for more men and also in carrying freight.

Development of better instruments and safety devices in the immediate years, Fokker said, would result in practically eliminating the difficulties which weather now places in the way of long-distance flying.

Record for Gliders

Ferdinand Schulz, a German, has broken the world's record by flying in a gliding machine 39 miles without an engine. Two weeks ago Schulz remained in the air 14 hours and eight minutes in a gliding plane, with no driving power. It is easy to imagine how this will develop scientific airplane construction in Germany.

Here's A Speed Record

Nineteen planes of the first pursuit group of Selfridge Field, Mich., commanded by Maj. Thomas G. Lanphier, accomplished a feat never before performed in the annals of the American flying forces May 11, when the group moved from Selfridge Field to San Antonio, a distance of 1,340 miles, in 11 hours and 25 minutes, flying time.

The planes were the last arrivals in a mobilization of 100 combat ships assembled at the four flying fields around San Antonio for participation in the joint air corps-land troops' maneuvers.

The achievement of the first pursuit group set a new record for the movement of a large formation over a long distance in a short time.

The average cruising speed on the trip was 116 1-2 miles an hour. The group hopped off from Selfridge Field at 4:50 a.m., Wednesday and arrived at Scott Field, Belleville, Ill., at 8:10 a.m., where the planes were serviced and the personnel procured breakfast.

The group left Scott Field at 9:10 a.m., and arrived at Muskogee, Okla., at 12:25 p.m. and took off for Kelly Field at 1:25 p.m. The group arrived at Kelly Field at 5:25 p.m.

Air Travel Safe, Says Moffett

Flying an airplane is safer now than ever before, in the opinion of Rear-admiral W. A. Moffett, chief of the bureau of aeronautics of the navy.

In a report to Secretary of the Navy Wilbur in connection with the recent large number of air fatalities in the naval air service, Admiral Moffett stated that "a general summation of the history of flying in the navy discloses that the unfortunate deaths which have occurred in the last few weeks are not a fair criterion, either of the safety of the airplanes or the efficiency of the personnel operating them."

Admiral Moffett laid the recent wave of aircraft deaths in the navy to the "vagaries of fortune." He also asserted that naval records during the 12 months ending March 26, last, disclosed that more than 20,000,000 passenger miles were flown by naval planes.

"During this time," he said, "there were 19 deaths, or a death for every 1,000,000 miles traveled by the average aviator.

"The scouting fleet alone has just completed a cruise during which more than 750,000 passenger miles were flown and during which there was neither death nor a serious injury to the personnel. More than 3300 landings have been made on the Langley Field without ever seriously injuring an aviator."

High-powered airplane propeller blades, made from ordinary canvas, and compressed into a non-corrosive product of metallic strength, designed to enhance the degree of safety in operation, will be used by the navy department on its training planes in the future, it was said.

Airplanes from now on must carry license tags similar to those on automobiles. In line with recent legislation by congress, the commerce department has issued regulations governing markings for aerial traffic.

And Now, Folks, Air Pullmans

With interest throughout Chicago intent upon the world-shaking non-stop flight of Captain Charles Lindbergh to Paris, thousands of Chicagoans were momentarily diverted, May 21, by the successful test flight of a "palace car" from Detroit to that city.

The air Pullman, with two pilots and seven passengers, flew northward over Lake Michigan near the short line, then south to give the city a glimpse of the luxury car, which, an hour or two earlier, had arrived in de luxe style.

Contracts for 33 Planes

A contract for 33 observation planes, to be constructed at an estimated total cost of $697,518, has been awarded the Chance Vought Airplane Co. of Long Island City, N. Y., by the navy department. Six of the planes will be assigned to the marine corps when delivered. Three each will be assigned the aircraft carriers Lexington and Saratoga, 18 will be used on light cruisers, and three will be held in reserve.

An Old Purdue Man Goes Back

A Talk About Engineers

By Carleton Hammond

IT WAS a great night for Purdue. Every old guard at the dinner felt it, knew again the annual thrill of re-union, talking over old times, conceived it to be his special and particular duty to impress the younger men at the table with the solemn importance of the occasion. Out in the business world one might not talk a great deal about such things, perhaps, but here, in the presence of the elect, those who had gone out from these halls and met Life, taken its wallops, and conquered it, well, one was likely to do and say and feel a great many very peculiar and beautiful emotions.

"And so," said the toastmaster, rather solemnly, but proudly, "I have the great honor and pleasure of introducing—let me say, rather, of presenting the next speaker, a distinguished graduate of Purdue."

After some semblance of order had been restored the speaker put his napkin in his pocket, thinking it was his handkerchief, and told how glad and proud he was to come back, and how pleased he was to be invited. "I wanted," he said, with something of a tremble in his voice, "I wanted to live over again in memory the days when I was a student engineer, as you are, with the same outlook on life and the same eager anticipation to play my part in it that I am sure you all have. That thought suggested my subject. I shall tell you what I think the world has to offer the young man who stands today in the place where I stood 30 years ago as an engineer just out of school."

That was the human touch that made the whole crowd kin. It was a fine key, too, to the thing that has made Lawrence A. Downs,

L. A. Downs, President of the Illinois Central R. R.

president of the Illinois Central System, successful in his chosen career—the proof that he had not outlived his understanding and human sympathy for the youngsters who were coming along over the same broad road he had traveled, not always a smooth highway.

"It is no exaggeration to say," Mr. Downs continued, "that in the last 100 years the human race has made more progress in economic betterment than it made in all the centuries that went before. The last century has given us the steam railroad, the electric railroad, the steamship, the automobile and the airplane for transportation. For communication it has given us the telegraph, the cable, the telephone and the radio. It has given agriculture the mower, the reaper, the thresher, the cream separator and the tractor. It has given industry the open-hearth furnace, steel, concrete, vulcanized rubber and the electric generator. It has given printing the power press, the linotype and the electrotype. It has given us all the electric light, the sewing machine, the elevator, the refrigerator, the typewriter, the adding machine, the phonograph, the camera and the motion picture. The list might be extended almost indefinitely. The point is that the last century has witnessed what amounts to an economic revolution. In that great transformation the engineer has had an important part.

"Engineering is at the foundation of virtually everything which marks the vast difference between life today and a century ago. Because of the accumulated knowledge and technique of modern engineering, we enjoy comforts and conveniences of which our ancestors never dreamed. Thanks to the engineer, we have railroads, bridges, sewage disposal, sanitation, irrigation, drainage, conduits, skyscrapers, modern highways, instantaneous transmission of intelligence, harnessed and applied energy and an understanding of the mysteries of chemistry with their manifold applications to industry, health and comfort. We need only compare conditions in those parts of the world where modern engineering has not been at work with conditions about us to understand the great contribution that the engineer has made to the economic advancement of the race."

It was the annual dinner of the Purdue branch of the American Society of Civil Engineers. Every man there could put a proper estimate on the speaker's words. They knew, all of them, that this speaker, who had started as a rodman at $60 a month when he quit college in 1896, and now is the head of one of the country's great railroads, had, literally, been through all the ropes. He was

saying things the coming class should know about.

"The modern engineer," he said, "is playing a larger and larger part in life. When I speak of the modern engineer, I speak of a factor in our civilization which no other civilization has possessed. In former times these were surveyors, architects and builders, but they were comparatively few in numbers and their knowledge of the science of engineering, as we know it, was crude and fragmentary. It is only within the last century that the profession of engineering has advanced to a position of outstanding leadership in the scientific and industrial world.

"Some persons may suppose that because there is not the necessity there once was for railway construction in new territory the need for the engineer in the railway field has lessened. The contrary is true. In railway transportation the need of men with an engineering background was never greater than it is today. The first problem of the railroads was one of constructing primary lines. They had to get their rails down, and they had to get them down under what at times must have seemed to be insurmountable obstacles. I would not reflect upon the great credit that belongs to the men who met and solved those problems; yet it is my opinion that the problems of present-day railway management, operation and construction call for vastly greater genius than was ever before required. There are better tools to work with today, but there is more and harder work to do."

The mere fact that a man is a graduate engineer, Mr. Downs said, does not qualify him for an important position in railway service or in any other field of industrial activity." "But," said the speaker, "if he is a good engineer, his chances of promotion will be so much the greater because of his qualifications. The engineer is taught to think straight, to see the plain truth without bias, to marshal facts and to analyze conclusions, and these qualities are needed by the railroads as well as by other modern institutions. But the engineer who aspires to promotion in the railway field—and this applies equally to any other branch of industry—must be more than a technician. He must possess broad vision. He must be able to analyze a situation and obtain the proper perspective of fact. He must be able to put his finger on guiding principles. He must possess mental and physical energy. He must have honesty, courage, initiative and confidence in himself. He must shoulder responsibility. He must be able and ready to make correct decisions. He must have imagination, decision and self-reliance. Above all, he must know the humanics as well as the mechanics of his job. He must be able to win and hold the respect and confidence of those who work with him and for him."

Handling Live Stock

Live stock is handled with greater expedition than any other traffic, except perishable freight. Special runs by locomotives often are made in gathering the stock and getting it under way promptly after loading, particularly where it originates on branch lines, as does a large proportion of it. The live stock trains from one division point to another are frequently, if not generally, moved at a speed several miles an hour faster than most other trains. Live stock also has expedited movement into and out of division terminals along the way. Special trains frequently run with only a few cars in order to reach division terminals and markets on time. Expedition is necessary to avoid as much as possible stopping in transit for water, feed, and rest. Other causes for expense occasioned by live stock are the showering of hogs, cleaning and disinfecting cars, and interference with other freight movements.

Shippers may send caretakers with the stock and no charge is made for their transportation. These caretakers ride usually in cabooses, although some roads provide special equipment known as drovers' cars. Free return transportation on regular passenger trains is provided if the caretaker has accompanied two or more cars of live stock to destination. The caretakers are expected to look after the welfare of the stock in such a way as to reduce loss and damage claims, and relieve railroad employes of certain duties in that connection. For 11 railroads it is estimated that at current fares this service amounted to 5.6 per cent of the revenues from live stock in 1923.

The empty car movement occasioned by live stock traffic is relatively high. Based on a study made by nine western carriers for October, 1923, it was about 86 per cent of the loaded car mileage, as compared with 25 per cent for box cars, 72.5 per cent for refrigerator cars, 80 per cent for coal cars, 62.3 per cent for flat cars, and 103.4 per cent for tank cars.

Live stock loads lighter than almost any other kind of carload traffic that moves in substantial volume. According to data covering 59 western railways or systems, the average loads for various classes of traffic in 1924 were: Horses and mules, 11.68 tons; cattle and calves, 11.57 tons; sheep and goats, 10.18 tons; hogs, 9.25 tons; and all carload freight, 30.15 tons.

Special equipment is necessary for live stock, and it is not generally usable for other commodities, although so used to some extent. Loading and unloading pens and chutes must be provided, not only at points where the traffic originates and where it is delivered, but at intermediate points as facilities for stopping stock in transit for water, feed, and rest.

The law requires the railroads to bear the expense of loading and unloading live stock at public stockyards and at points where it is stopped for water, feed, and rest.

What the Papers Say

NEVER were the railroads of the United States rendering such service as today. This means that our shippers and travelers are getting the best service and the lowest rate of any country in the world. Statistics prove these statements. This record of private management, when compared with two years of federal control and the billion 600 million dollar deficit which fell on the taxpayers to pay for the two-year period, is a remarkable testimonial to the efficiency of present railroad management. — Watertown (N. Y.) Standard.

The Public Responsibility

There is more reason at present for confidence that the railroad problems of the United States will be solved in a manner beneficial to the public, the employes and investors in railway securities than there has been within the last 20 years.

The progress made is due mainly to a better understanding of the railroads on the part of the public, and the future of the railways is in their hands.—Bridgeton (N. J.) Pioneer.

Recapturing Railroad Earnings

. . . As has been said so often in these columns, there is no theoretically best basis of rate regulation nor is there a satisfactory way to enforce "recapture" measures which are intimately related to the subject of rate control. A pragmatic attitude toward the whole problem is essential. The railroads must be treated reasonably. Investors must not be discouraged from advancing the capital needed to maintain and improve the transportation system of the country. They will, however, be disposed to do so if the Interstate Commerce Commission is permitted to enforce its rulings in regard to "recapture" of earnings.

Under the best of conditions, section 15a, if hereafter enforced, will greatly reduce the incentive to increased efficiency on the part of the more prosperous roads. Invoked to extract income earned in the past from carriers that may not be enjoying excessive prosperity in the present, it is a dangerous weapon of offense. Fortunately the menace is not immediate, since it can be taken for granted that the roads will not submit meekly to the new ruling. —Journal of Commerce.

Railroads Go Into Auto-Trucking

The Interstate Commerce Commission is encouraging the railroads to build up auto-bus and auto-truck lines as auxiliaries of their transportation. The policy is little short of being revolutionary. A few years ago, relatively, the government drove the railroads out of the coal trade. It drove railroad-owned package freighters off the Great Lakes. Its attitude was severely hostile toward any endeavor of the railway companies to link up different forms of transport or to connect industries of even closely allied character. High finance was tamed and broken to the harness of governmental regulation.

Some of the action taken against the carriers was justified, but it is at least tacitly admitted in Washington now that by putting hobbles on enterprise the entire system of transportation was hampered and clogged, and this eventually had to be paid for by the country in insufficient facilities for moving the products of the farm and the factory. The new point of view is that every aid to commerce is a stabilizer of prosperity, a protection to regular employment and a promoter of the improved welfare of the citizenry. — Detroit Free Press.

Danger of Limiting Profits

Dr. Arthur T. Hadley of Yale does not believe in limiting the earnings of railroads and other public utilities by law. He says the effect of the 5¾ per cent limit of the Esch-Cummins law is to check railroad companies in experimenting to find ways to reduce transportation costs. The public suffers because the carriers are forced to muddle along in old wasteful ways. If an experiment is successful and increases profits, along comes the law and cuts the rates. If it is a failure, the company stands the loss. There is no advantage in improving methods.

Dr. Hadley might have said more along the same line. Limitations on profits induce a concern to let expenditures run, rather than to save at great effort and have the government take the savings. The same rule holds true with regard to income taxes.—St. Paul Dispatch.

The Deadening Touch

Government ownership is the product of loafing minds and loitering ambitions. It is the indolent offspring of the static mind, and its ancestry may be traced back through a long line of dawdling political soothsayers. As a theory it lacks imagination, originality, inspiration and romance. As an actuality it is a stupid, dull, languorous method of carrying on the work of the world. It is the substitution of government deficits for

private profits. It is the dragging brake on individual enterprise and a stubborn barrier to industrial progress.

It is the Santa Claus idea of government, heralded by political sleigh-bell ringers. It has never won an economic battle despite the unfair advantages it demands in its own behalf. It has never developed a new idea; it has never created anything except jobs. It is destructive of wealth growth and productive of debt growth. It deadens the will to do and nourishes the will to be done for. It makes politics instead of business the national dividend producer.—Henry Swift Ives, Vice-President. Casualty Information Clearing House.

A Liberal Valuation

The availability of the railroads for political attack makes it important that the valuation on which earnings are computed be sufficiently high to permit a return that will attract adequate capital. There are different ways of accomplishing this end, but a valuation that is liberal and yet not inflated provides one very satisfactory solution.—Philadelphia (Pa.) Public Ledger.

Adding Confusion

The Interstate Commerce Commission has taken about thirteen years to arrive at a tentative valuation of the railways of the country, and has spent some 120 million dollars on the undertaking. The announcement which it has just made of the principles upon which it has proceeded appears, however, to have added to confusion and apprehension instead of clearing the air.

Whether it will be practicable, on the principles which the commission has adopted, to base rates upon the valuations as finally determined, without reinstating the gross inequalities which it has been one of the tasks of the commission to remove, is not clear, but it is hard to see how the lines which the commission has followed can lead to an equitable fixing of charges for transportation service.

The Supreme Court, in the Los Angeles & Salt Lake case, was able to defer its own entry into the controversy until such time as the commission should undertake to enforce rates based upon its valuation. In the meantime the whole matter of investment in railway securities is clouded by the impending application of a scale of values which few, if any, of the railways will recognize as corresponding to actual fact, and by the segregation of millions in earnings for problematical recapture.—Financial and Commercial Chronicle.

The True View

In his brief supplementary dissenting opinion Commissioner Woodlock brusquely disposes of the majority's main fallacy. The majority, he argues, wants to tie railroad valuations up with the dollar. But the dollar's value has fluctuated greatly since 1914, as everybody knows. He says:

> This it is which constitutes what I must call the basic unfairness of the majority's proposal to stamp the greater part of railroad property in existence today with the dollar relation of 1914, thus saddling perpetually upon the owners of that property the loss inherent in the depreciation of the dollar since that time.

The rational thing to do, as Mr. Woodlock suggests, is to tie railroad property up with other forms of property, all of them standing in the same valuation relation to the dollar. That is the economic solution which the Supreme Court has favored. The real issue in the St. Louis-O'Fallon valuation is now one between the majority of the commission and the courts.—New York Herald Tribune.

Subsoil Drains Are Needed

By J. A. Redfield
Asst. Engineer of Maintenance, C. & N. W. Ry. Co.

Within the last few years it has become evident to us that to carry the increasing loads on our track structure we must begin to improve our sub-grade, as well as our rail and ballast.

We purchased our first Jordan Spreader ditcher in 1924, and now have three of these machines. The benefits derived from opening and constructing road bed surface drainage with these ditchers during the last two seasons have been so obvious that I look for a considerably increased authorization of the sub-soil drainage in the future.

During the last season we placed sewers in some of the poorly drained station grounds on our heaviest traffic main line where track surfaces have been below par and maintenance has been excessive due to the softening of the subgrade by water soaking into it.

During the coming season we expect similarly to drain several other station grounds on the main line, and also to undertake the construction of sewer pipe drains in certain cuts where it is obvious that the ordinary cut ditches are not draining low enough to protect the track.

We probably shall drain and stiffen fills in certain gumbo territory, where we handle a heavy passenger traffic, by constructing rock-filled drain buttresses.

Secret of Success

The secret of success is thrift in all its phases, thrift as applied to saving. A young man may have many friends, but he will find none so steadfast, so constant, so ready to respond to his wants, so capable of pushing him ahead, as a little leather-covered book, with the name of a bank on its cover. Saving is the first great principle of all success. It creates independence, it gives a young man standing, it fills him with vigor, it stimulates him with the proper energy; in fact, it brings to him the best part of any success—happiness and contentment. If it were possible to inject the quality of saving into every boy, we would have a great many more real men.—Sir Thomas Lipton.

Making Ties Now From Scrap Rails

More Dependable Than Wood

By William Dalton

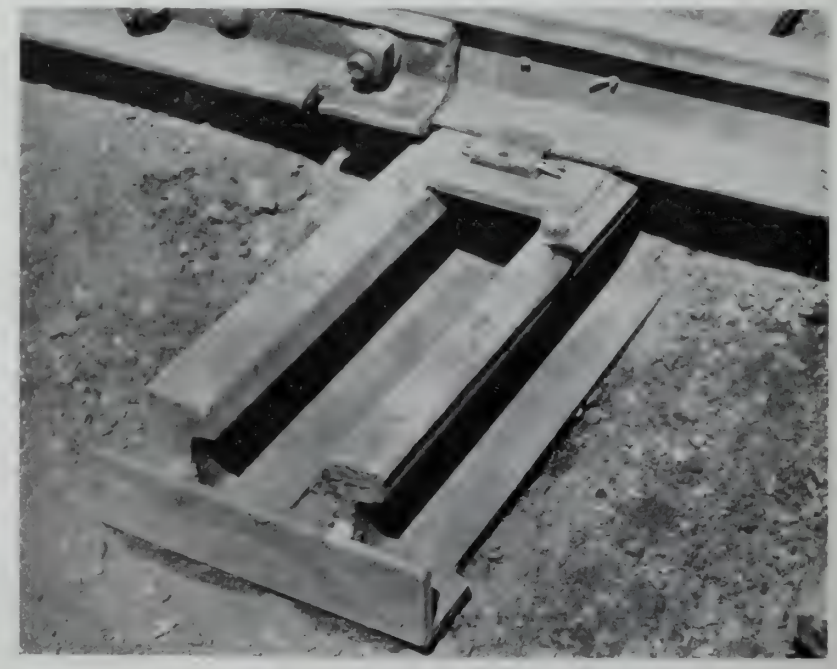
THE constantly increasing cost and decreasing quality of timber ties, and the possibility of getting much more structural strength per dollar from other material, has led to an investigation of possible substitutes. This investigation assumes even greater importance when it is realized that the speed and safety of trains are now limited as much by the strength of the track as by any other factor.

Taking up the design of a steel tie, three distinct problems are encountered, the tie design, the design of a dependable rail clamp, and the production of a cheap insulator for main line signaled service. The first two problems must be solved as one; but the third can be considered separately, since about 40 per cent of the present track is in yards and sidings and is not signaled.

The H-section beam gives the maximum strength per pound of metal. When used as a tie, however, it slides very easily in the ballast in both directions. This movement can be stopped by fastening bars to each end of the tie beam and making these bars the same length as the spacing of the ties in the track. The tie beam must be wide at the bottom to provide bearing surface on the ballast, and it must be wide enough on top to give sufficient bearing against the rail to prevent the anti-creeping device from tipping it. The punching of any holes in the tie-beam flange, for rail clamps or fasteners, weakens the flange. This can be avoided by fastening separate plates to the tie beam. If the rail fasteners are placed on the outer edge of the beam, the wave action on the rail strains the fasteners severely and the flange of the tie beam is also fatigued at its junction with the web. It is, therefore, better to use fasteners placed over the center of the tie. These conditions can best be met by using two beams held together at the top by a tie plate and at the bottom by the end bars needed to prevent movement in the ballast. Using two beams instead of one gives the greatest bearing surface on the ballast with a minimum height. As the edges of the tie plate can be placed over the center of the top flange of the tie beams, the wave action of the rail throws the load directly over the webs of the beams instead of on the outer edge of the flanges. Such a design also reduces the number of rail clamps to a minimum.

Arc welding has been tried as a means of fastening the parts together; and a year's test, under severe track conditions, has demonstrated its value for this service. The use of welding makes a variety of designs possible. If made of new metal, the costs will prohibit the economical use of any of these designs at present but, if made of scrap material, they are worthy of careful consideration. As welding becomes the largest item of cost, next to the material, the arrangement which uses the least amount of welding will prove cheapest.

Worn rail, taken from the track in large quantities yearly, offers a very convenient supply of scrap material for this purpose. By the use of automatic welding machinery, the worn rail tie can be produced for about 60 cents, to which the scrap value of the old material must be added. This value, however, will be recovered when the tie is discarded. The cost of the tie plate, which must also be



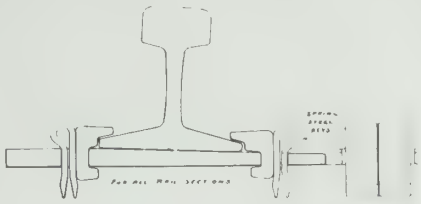
Arc Welded Railroad Ties, Made Out of Scrap Rail, in Use D. & H. R. R.

added, will be the same as for wood ties.

To make a fastener for a metal tie, it is necessary first to decide whether the tie should be made suitable for any section of rail or if it is satisfactory to limit its use to a particular section that is standard for the road in question. Since the gauge of the track is a constant, the rail fasteners for general use would be required to accommodate three variables; thickness of rail head, which governs the distance center to center of the rails; width of flange; and thickness of flange. The design of a fastener for a special section, however, would be affected by the flange thickness alone, the range of which is small. The standardization of the width of rail heads and flanges and thickness of flanges becomes a matter of great importance when metal ties are considered. The fastener must be safe and secure under the hammer-blows from heavily loaded and rapidly moving wheels. It must be simple and quickly applied without the use of special tools. Many designs are based on the use of bolts and rivets, but these tend to rattle loose in service and require constant attention.

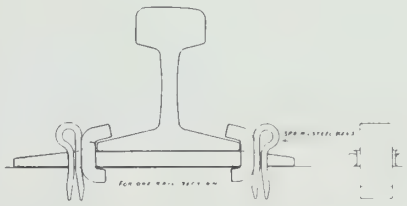
By test it has been found that metal ties are very satisfactory in service. They have a greater bearing service on the ballast than have wood ties. There is no movement of the tie in the ballast. The rail clamps are more dependable than spikes, and the tie can be put in place and clamped to the rail more quickly than the rail can be spiked to gauge on wood ties. The tests show that four spikes driven in a wood tie will fail under side loads ranging from 12,000 to 15,000 lb.

It is an easy matter to make a track insulator, but it is difficult to make a cheap one that will stand heat, cold, moisture, acid, alkalies, and the severe mechanical punishment to which it is subjected between the rail and the tie plate. It must be able to withstand at least 1000 lb. per sq. in. pressure and also the abrasion due to the creeping of the rail. Several materials are being investigated, but it will take a long time to make the necessary service tests to determine the cheapest satisfactory material. Canvas impregnated with bakelite



Fastenings for All Rail Sections

seems likely to give good results. It withstands shock and wear when used in gear teeth and, apparently, has all the necessary qualities. This investigation will be continued as the metal tie and fasteners have proved their dependability in yards and are now available for insulator tests.



Fastenings for One Rail Section

Why Prices Go Down

A significant development in business has been the gradual decline in the level of commodity prices during the past year or year and a half. This decline is ascribed mainly to two causes, a potential capacity for a rate of production much in excess of any demand likely to develop; and efficiency in transportation, which gives us a hitherto unknown promptness in delivery, facilitating hand-to-mouth buying, and tending to help keep the rate of production currently in step with the rate of sales.

Both these causes probably will continue to be effective for some time; but their effect will, in all probability, be more and more that of stabilizing prices. — Business Bulletin, La Salle Extension University.

"The best thing to give to your child is a good example."—Balfour.

"The kindly glance, the friendly smile, help make our daily lives worthwhile."

Arc Welded Metal Railroad Ties, Made Out of Scrap Rail, in Use by D. & H. R. R., in its Glenville Yards. General View from Above.

Railways and the College Men

Illinois Central Essay Contest

By Howard Kennedy

WHAT the present-day public thinks and says and does about railroads is important. No one knows this better than the heads of these great properties. Wasn't it L. W. Baldwin, president of the Missouri Pacific, who said that railroad men had a right to be hardboiled; they'd been in hot water so long? And didn't President Gray of the Union Pacific declare that above everything else railroad men wanted to be understood? Such men know what they are talking about.

But what the public tomorrow—the coming public—will think and know about steam transportation is a mighty question and L. A. Downs, president of the Illinois Central, is doing a fine work in answering it. The best way to have this rising generation well informed, Mr. Downs knows, is to get it interested in the subject, and the best way to achieve that object is to arouse the competitive instinct; and all American young men know this element inside out.

So not long ago President Downs announced a contest the result of which is tersely explained in a booklet just issued by his road containing ten essays chosen by the combined vote of 12 judges as the best out of 321 submitted on "The Place of the Railroads in the Life of the American People." Students in 39 colleges and universities along the lines of the Illinois Central System competed. A prize of $50 was awarded for the best essay from each institution, and a grand prize of $100 in addition was awarded for the best of the winning 39. The winner was James J. Donohue of Columbia

James J. Donohue.

College, Dubuque, Iowa. The nine others received honorable mention. This is Donohue's contribution:

In 1826 three miles of railroad were built from a little port in Massachusetts to a granite quarry in the hills nearby. It was the first suggestion of an American railroad, and people wondered. One summer day a hundred years later an electrically driven train, the first of a new and improved service, pulled into the suburban terminal of the Illinois Central R. R. in Chicago. Thousands witnessed the event, but no one wondered. The railroads had become as common, and as necessary, as food.

As history counts time, it was not far from the little eastern port with its toy-like railroad to the great metropolis of the West with its monstrous roar of traffic; but in this time was reared the greatest of industries, and the American railroad took its place in the sun. As history counts change, however, the great city whose influence reaches to the uttermost frontiers of our country through its shining nerves of steel is miraculously removed from the Massachusetts village. The infant industry that was designed to carry a few tons of granite has grown and filled the land, and in one century it has wrought more change than the warring of the kings of the earth might occasion in five. And it is the infant grown great that has given Chicago its greatness.

It is one hundred years since that primitive road was built. What, then, is the place which the railroad has taken in the lives of the American people? It has become an outlet for our effort, a minister to our comfort, a guaranty of our supremacy, a preserver of our unity and a servant to all in which we have an interest. In short, it is beyond a doubt the most potent and least dispensable economic factor of present-day life, and of the last century's progress.

The railroad is an outlet for our effort. Land, labor, capital and management are the four sources of income. All primary human effort is expended toward gaining a livelihood in one of these four fields. But how has the railroad entered into this most essential of human activities? Each of these factors it has aided, directly and indirectly. Directly, it has turned to its own profit millions of acres of land and innumerable other resources, and its property investment today greatly exceeds 20 billion dollars; it has offered to men the greatest division of labor that the world has ever known, and it employs a personnel of 2,000,000; it has offered an unparalleled field for capital, and about 2,000,000 persons hold more than 20 billion dollars interest in it; to enterprise it has offered incalculable opportunities in the management of these billions upon billions. Indirectly, it has aided the value of all economic factors by extending the scope of their effectiveness, and making them possible in removed places. The products of land and labor and the services of capital and promotion may now find a world-wide market as close as the nearest railway station.

The railroad is a minister to our comfort. Of old a man might not travel even a few miles without paying dearly in money and discomfort; now he is whisked across a continent in ease and at small cost. Formerly even a message was expensive and uncertain; now the lightest word leaps rivers, scales mountains and traverses plains with speed and surety, and the cost is negligible. Not only do the railroads contribute thus to man's comfort, but they bring to his very threshold the luxuries of six continents and drop at his feet the treasures of the seven seas.

The railroad is a guaranty of our supremacy. The preservation of our financial, agricultural, manufacturing and commercial leadership depends entirely upon the maintenance of our railway supremacy, and upon it, too, depends our self-sufficiency. Without our railroads the vast expanses of our resourceful continent would become a desert, not of barrenness, but of inaccessibility.

The railroad is a preserver of our unity. The United States is one great homogeneous unit. We speak a tongue less differentiated from place to place than any other nation in the world; we have a uniform standard of living and like ideals. The railroad almost alone has vanquished the forces of circumstance and time, and the realm of provincialism decreases as its dominion is

enlarged. We are one, and our railroads have made us such.

In summary, everything that makes our life different from that of our ancestors owes an enormous debt to the 400,000 miles of track that span our country and bind distant parts to the vital centers and the centers to each other. Without the railroads, the essentials of life would become difficult of attainment, comforts would become few indeed, and luxuries would become unknown. Our life, our activities, our minds would become narrow and provincial. The continents would draw out into intraversable expanses, and the mountains would leap up into impassable barriers. Progress would confine itself to the seas and waterways, and our great inland empire would sink into backwardness. Yes, indeed, the railroads are desirable, important, essential—unless luxuries are not desirable, comforts not important and necessities not essential, for in our age they all depend upon the railroads.

The railroad came in with the roaring age of steel that replaced the placid age of wood. Now we stand on the threshold of another epoch; but in the new age the thunderbolt of the rails shall have its place. It is still the carrier of the future. Inland waterway transportation does not properly compete with the railroads, and when it does so it ordinarily has by far the worse of the encounter. Automotive transportation is unfitted to handle voluminous traffic over great distances, and it often sins in unreliability and discomfort. Air transportation is unable to handle volume and is as yet, though not irretrievably, unsafe. Whether electricity replaces steam does not matter to the railroads, in the last analysis. In fact, more progressive ones have already taken steps to welcome it under conditions where steam is ordinarily used. Yes, the place that the railroads have earned is secure.

It is difficult to outline in a few words the vast importance of this national institution. It is clear, however, that the railroads may be considered, without exaggeration, the most potent and least dispensable economic factor of present-day life, and they have every prospect of continuing to enjoy this position in the greater epoch that is to come.

There. What do you think of that? When you get the generation to think and talk and write this way about a great industry there is hope for the future. Every one of the ten essays included in the booklet is good, worth far more than any cost. Every one of the 321 essays ought to be printed, and the station agents of the whole country should hand them out to every customer.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

Largest Freight Traffic in History

The volume of freight traffic handled by the Class I railroads in March was the greatest ever offered to them in any March on record, according to reports filed by the carriers with the bureau of railway economics. Freight traffic for that month amounted to 41,816,180,000 net ton miles which exceeded by 2,218,535,000 net ton miles or 5.6 per cent the best previous record for any March which was established in 1923. It also exceeded by 3,147,280,000 net ton miles or 8.1 per cent that for March, 1926. In the eastern district, an increase of 8.2 per cent in the volume of freight handled was reported compared with the same month last year while the southern district reported an increase of 1.6 per cent. The western district showed an increase of 11.1 per cent.

Freight traffic for the first three months this year amounted to 118,293,890,000 net ton miles, the greatest ever reported for that period in the history of the railroads. This was an increase of 6,544,591,000 net ton miles or 5.9 per cent over the best previous record established during the corresponding period in 1926. It also was an increase of 12,366,501,000 net ton miles or 11.7 per cent over the corresponding period in 1925. Railroads in the eastern district reported an increase of 6.8 per cent in the amount of freight handled by the railroads in the first quarter compared with the corresponding period the year before but the southern district reported a decrease of nine-tenths of one per cent. In the western district, an increase of 7.5 per cent was reported.

C. of G. Gives Veterans Dinner

The Central of Georgia gave a dinner in Macon, May 25, for the employes of the road who had been in the service for 25 years or more. President Pelley gave all such employes appropriate emblems.

New Airplane Stabilizer

Tests were made in May of a new airplane stabilizing device at Clover Field, Santa Monica. In a plane equipped with the device, Leo Nomis, an Air Reserve officer, flew for 45 minutes with his hands outstretched, part of the time facing the rear of the plane. The tests followed six months of experiments by the inventor, Robert Mitton, of Salt Lake City. The device consists of a pendulum attached to a compressed air device which in turn is attached to the controls of the plane, and a gyroscope on the rudder. The two combined, it is declared, will keep a plane level, and is expected to be particularly valuable at night or in fog.

Loree Consolidation Not Approved

The proposal of L. F. Loree to have the Kansas City Southern take over the Missouri-Kansas-Texas and the latter, in turn, acquire the St. Louis Southwestern, was rejected by the I. C. C. on May 19 as "not in the public interest."

Request for Bus Service Extension

The San Diego Electric Ry., San Diego, has applied to the railroad commission for certificates of public convenience and necessity authorizing it to extend its bus service from Fifty-sixth Street in San Diego, along El Cajon Avenue to La Mesa, outside the city; and also from the junction of Imperial avenue and Thirty-fourth street in the city to the La Mesa district.

Revenue Freight Loading

Total loading of revenue freight for the week ending May 14 amounted to 1,029,126 cars. This was a decrease of 622 cars from the corresponding week last year but an increase of 43,247 cars over the corresponding week two years ago. It was, however, an increase of 4,710 cars over the preceding week this year, due principally to increased loading of coal while forest products, ore and coke also showed increases. Decreases were reported in the loading of miscellaneous freight, merchandise and less than carload lot freight, grain and grain products and live stock. Coal loading for the week of May 14 totaled 163,150 cars. This was a decrease of 4,528 cars under the same week last year. It was, however, an increase of 6,418 cars compared with the same week two years ago. Miscellaneous freight loading totaled 394,794 cars, an increase of 8,216 cars over the corresponding week last year and 36,135 cars above the same week in 1925. Loading of merchandise and less than carload lot freight for the

week totaled 261,946 cars, a decrease of 5,338 cars under the same week last year, but 2,501 cars above the corresponding week two years ago. Grain and grain products loading totaled 40,-147 cars, an increase of 444 cars over the same week in 1926 and 4,616 cars above the same week in 1925. In the western districts alone, grain and grain products loading totaled 23,776 cars, an increase of 1,964 cars over the same week last year.

Live stock loading amounted to 29,-161 cars, an increase of 2,697 cars over the same week last year and 2,742 cars above the same week in 1925. In the western districts alone, live stock loading totaled 22,106 cars, an increase of 2,271 cars above the same week last year. Forest products loading totaled 70,924 cars, 5,079 cars below the same week last year and 4,884 cars under the same week in 1925. Ore loading amounted to 58,107 cars, 3,866 cars over the corresponding week in 1926 but 5,-502 cars below the same week two years ago. Coke loading totaled 10,897 cars, a decrease of 900 cars under the same week last year but 1,221 cars above the same week two years ago.

All districts except the eastern, Allegheny, central western and southwestern reported increases in the total loading of all commodities compared with the same week in 1926 while all except the southwestern reported increases compared with the same period in 1925.

Loading of revenue freight for the first 20 weeks of 1927 totaled 19,309,366 cars. This compares with 18,799,995 for the same period in 1926 and 18,462,-225 in 1925.

Car Movement Speeded Up

Class I railroads are handling the heavy freight movement now being offered to them with the greatest speed ever reported for this season of the year, according to the bureau of railway economics. The average daily movement per car in March, was 30.9 miles per day, the highest average for that month ever attained since the compilation of these reports started in 1917. The daily average was an increase of 1.7 miles above that for March last year and an increase of 4.5 miles above the average for March 1925.

Reports filed by the railroads with the bureau also show that freight cars are being loaded more nearly to capacity now than at this season in the three previous years although the average load per car is not so great as in the years prior to that time. The average load per car in March, according to these reports, was 27.4 tons, an increase of one ton compared with the average for March, 1926, and an increase of 1.3 tons compared with March, 1925. It also was an increase of eight-tenths of one ton above that for March, 1924, but was a decrease compared with 1920, 1922 and 1923.

C. & O. Statement Shows Gain

Increase in gross revenues, net railway operating income and net income of the Chesapeake & Ohio, with improvement in operating ratio are shown in the statement of operations for April, 1927. Gross revenues for the month were $10,964,860, an increase of $1,288,-224 over April of last year; operating expenses were $7,604,875, an increase of $333,748; net railway operating income is $2,797,201, an increase of $697,237. The net income after all charges for the month was $2,113,724, an increase of $256,988 over last year. The operating ratio is 69.4 per cent compared with 75.1 per cent for April of last year, or a decrease of 5.7 per cent. For the four months ended April 30, the gross revenues were $44,123,284, an increase of $4,207,828; operating expenses were $30,-286,398, an increase of $705,588; net railway operating income was $11,573,271, an increase of $2,634,162. The net income after all charges is $8,859,462, an increase of $2,522,299. The operating ratio for the period is 68.6 per cent, a decrease of 5.5 per cent over the same period a year ago.

A 500-Mile Bus System

The Chicago & Alton, through its subsidiary, the Alton Transportation Co., plans to operate a 500-mile system of bus lines in Illinois. Applications for certificates of public convenience and necessity to permit the operation of buses on seven routes have been filed with the Illinois commerce commission. Four of the proposed routes will parallel the main lines of the Alton between Chicago and St. Louis. One of the applications is for permission to operate a bus line between Joliet and Bloomington, 90 miles; another proposes a route from Bloomington to Springfield, 60 miles; the third covers the 39-mile route between Springfield and Carlinville; and the fourth is for a bus line from Carlinville to Mitchell, approximately 50 miles. The other three lines will extend from Dwight to Lacon, 50 miles, will radiate from Peoria to Springfield, 66 miles, and from Peoria to Chenoa, 48 miles. The total bus line mileage under the seven certificates applied for will approximate 408. This mileage, with the 95-mile route between Jacksonville, Ill., and St. Louis, Mo., which they now operate, will run over 500 miles.

New Bus Line Started by C. of N. J.

The Central of New Jersey, through its subsidiary, the Jersey Central Transportation Co., began the operation of motor buses May 22 on the Lakewood-Barnegat route. The new operation is known as the "Jolly Tar Trail" and the bus service is provided in substitution for trains taken out of service. Barnegat is reached by railroad by a branch line which joins the main line at Lakehurst, 7.9 miles south of Lakewood. The ordinary daily train service on the branch has consisted of one through express train between Barnegat and New York in both directions, which ran over both the branch and the main line. Other train service on the line consisted of three daily round-trips from Lakehurst to Barnegat, connections being made at the former point with main line trains running between New York and Atlantic City. The bus service takes the place of the three branch line round-trips. The round-trip for the express train between Barnegat and New York will be retained. The terminus of the bus operation is Lakewood instead of Lakehurst, the former being the larger community of the two and a more convenient point for making train connections.

New Bus Line in Colorado

The Denver & Rio Grande Western, through its subsidiary, Denver & Rio Grande Motorway, Inc., has been granted a certificate to operate a motor bus line between Alamosa, Colo., and Monte Vista. The order of the commission specifies that the railway must not reduce its train service and tickets must be interchangeable as between buses and trains.

Buses to Pay Higher Toll

The Delaware river bridge toll charged single deck buses of the Philadelphia Rapid Transit Co. was increased from 25 cents to 50 cents per trip and the double-deck bus rate was raised to 75 cents, from the old rate of 40 cents, at a meeting on May 20. Independently operated buses, which have been paying a rate of 40 cents, will be charged 50 cents when the new rates become operative July 1. The commissioners estimated the new rates would increase the annual bridge revenues by $250,000.

Santa Fe Veterans Honored

Celebrating his 50th anniversary in the service of the Santa Fe, officials and employes of the Coast Lines gave a banquet at the Alexandria Hotel in Los Angeles in honor of Harry Isaacs, assistant general baggage agent of the system. At the same time honor also was given M. B. Terrass, office engineer, who has been with the company for 46 years.

Buses Replace Railway

The New York & Stamford Ry., Stamford, Conn., has been authorized to discontinue the operation of its railway between Atlantic Square, Stamford, and the New York state line and to substitute bus service between the same points. To operate the bus service the County Transportation Co., Inc., has been organized as a subsidiary.

$50,000 for Safety Signal

The Key System Transit Co., Oakland, Cal., has announced the immediate expenditure of more than $50,000 in the erection of safety signal devices. The safety device being installed is the result of research on the part of H. P. Bell, chief engineer of the company. The signals are being installed at all the important crossings.

The New Train "Columbine"

The Chicago & North Western and the Union Pacific have announced that beginning May 15 a new train to be known as "The Columbine" will be operated over the Overland route between Chicago, Omaha and Denver.

Railroad Offices to be Moved

The Southern Pacific of Mexico has announced that the offices of the engineering staff, auditors, etc., now in Tucson, will be moved in July to Guadalajara.

Air Mail Contract Award

The National Air Transport, Inc., has been awarded the contract for carrying the air mail between Chicago and New York beginning August 1. The contract is based on a rate of $1.24 a pound.

Railroad Service Abandoned

Unable to meet expenses, the Sacramento Northern has been authorized by the state railroad commission to discontinue its line from Chico, Butte county, to Hamilton, Glenn county, California.

Frisco Net Increases

Notwithstanding a decrease in gross revenue of $309 320 due to a falling off of passenger business occasioned by competition, the annual report of the St. Louis-San Francisco Ry. made public May 18, shows an increase of $916,471 in net operating income due principally to economies in operation which resulted in reduced transportation cost. The report, prepared by President Kurn to the stockholders, shows an excellent accomplishment in transportation service by Frisco lines in 1926. The surplus, after interest and taxes in 1926 was $7,546,153. The operating revenues for 1926, the report shows, were $94,406,054, a decrease of $309,320, or 0.3 per cent less than 1025. Operating expenses were decreased also, however, to $65,921,909, or $7,036 less than in 1925. Net railway operating income totaled $23,238,575, an increase of $916,470, or 4 per cent over 1925. Railway tax accruals totaled $4,842,387, a decrease of $250,736, or 4.9 per cent compared to the previous year. Despite this decrease, records of the company show its taxes have increased from $896,958 in 1907 to $4,842,388 in 1926, or more than 440 per cent. The report states that although the company's mileage increased 10 per cent from 1907 to 1926, the increase in taxes paid for 1926 over 1907 is equivalent to a dividend of 6.65 per cent on the entire capital stock of the company. A remarkable record was made in operating economies. Gross tons per train mile and net tons per train mile, were boosted to a new high record. For July, 1926, gross tons per train mile were 1,466 and net tons per train mile 623. A net credit of $1,666,196 was received for per diem on freight cars interchanged, as compared with a net of only $765,526 for the previous year. After providing payment for mileage of tank, refrigerator and other private line cars, there remained a net charge to hire of equipment for 1926 of $80,247 compared with $1,121,423 for 1925, and $439,322 for 1924. The pounds of fuel consumed per 100 gross ton miles was 176 as compared with 187 in 1925.

Full dividend of 6 per cent on the preferred stock and 7 per cent on the common stock for 1926 was paid in quarterly installments. A quarterly dividend of 1¾ per cent on the common stock was declared payable January 1, 1927, to all stockholders of record December 15, 1926. Dividends of 6 per cent were declared in advance for 1927 on the preferred stock in quarterly payments.

New equipment put into service on the Frisco during 1926 included 25 locomotives, 14 passenger coaches, 2500 50-ton box cars, 1,000 50-ton automobile cars and 500 55-ton gondola cars. New equipment built in the company's shops during the year included 950 freight and several baggage cars and in addition, 1341 freight cars were reconstructed, 3217 given general overhauling, 7199 painted and 339 passenger cars overhauled and painted. The principal roadway improvements during the year, included the laying of 168 miles of new 100 pound rail, and 27 miles of new 90 pound rail, a total of 195 miles; five highway grade separations were effected, and 675,986 cubic yards of ballast applied. A total of 1,785,573 ties were renewed and 10.28 miles of trestle bridges were renewed. Substantial progress was made during the year in the rehabilitation of the line of the Muscle Shoal, Birmingham & Pensacola R. R., extending from Pensacola, Florida, north to Kimbrough, Ala. It is expected that the work will be completed, except for ballasting, in the spring of 1928. The construction of a connection between the Muscle Shoals lines and the Frisco system is the most important project for 1927. This line will run from Aberdeen, Miss., to Kimbrough, Ala., about 152 miles, and when completed will provide an outlet to the Gulf of Mexico.

Tractor Shipments

April shipments of electric industrial trucks and tractors, as reported to the department of commerce by the nine leading manufacturers in the industry, were 105, as compared with 111 in April, 1926. Shipments for the first four months of 1927 total 449 as compared with 485 for 1926. Total shipments for the full twelve months of 1926 were 1415. Ninety-eight were exported and the balance domestic shipments.

Ask for Six-Cent Fare

Application for an immediate emergency 6-cent fare on all lines operated by the Los Angeles Railway Corpn. was filed May 17 with the California railroad commission. A hearing permanently to increase the rate of all yellow lines is now before the commission. The 6-cent rate, according to a statement issued by George J. Kuhrts, vice-president and general manager, is necessary to maintain the present railway system pending the outcome of the present hearing relative to the 7-cent rate. He added that the railway would be unable to proceed with its plans for the purchase of additional equipment and the carrying out of improvements unless the immediate relief, available through the emergency 6-cent fare, was granted.

Chicago Switching Inquiry

A general investigation of all switching rates in the Chicago district was ordered on May 13 by the I. C. C. A revised schedule of switching rates proposed by the railroads and backed by the Chicago Association of Commerce was recently suspended by the commission after protests from a large number of shippers had been received. The suspension proceeding has been joined with the general investigation now ordered.

Texas Railway Charter Surrendered

The Paris Transit Co., Paris, Texas, has surrendered its charter to the secretary of state. The company has owned and operated the railway system of Paris for 37 years and notwithstanding the fact that the city has more than 15,000

population, the company finds itself unable to compete with the private automobile and the "For Hire" car and has decided to abandon its lines. W. G. Moore, manager, said that in authorizing fare increases and preventing bus competition the city officials had prolonged the life of the company, but the competition from privately owned automobiles reduced the revenues of the company to a point where hope had disappeared that the line could ever again be made profitable.

Vanderbilt Increases Holdings

Press reports state that the New York Central's list of stockholders at the close of 1926 discloses that H. S. Vanderbilt increased his stock holdings 21,000 shares during the year to 143,000 shares, more than the stock shown in the names of George F. Baker, and George F. Baker, Jr. Registered holdings of the Vanderbilt family were 256,532 shares, against 236,189 the year before. George F. Baker added 2,000 shares to his holdings. Only seven stock exchange houses had a block of more than 12,500 shares with an aggregate of 123,932 shares.

Makes Offer for Short Line

Details of the proposed purchase of the Sacramento Short Line by the Western Pacific were submitted to Short Line directors on May 13. The offer is made in the name of the San Francisco-Sacramento Railroad, a subsidiary of the Western Pacific and provides for purchase of all the outstanding preferred stock at $20 a share and common stock at $5 per share, payable on or before August 1, under certain conditions. The present prospective purchasers made an offer and took 40,000 shares of common at $5 per share in March, obtaining control at that time. There were originally 62,429 shares of common and 12,427 preferred outstanding. The new offer, according to the conditions explained, must be accepted on or before August 1 by the holders of at least 91 per cent of the preferred stock and the holders of at least 10,000 shares of common over and above the 40,000 already purchased. In the event of any unusual casualty or unusual happening before August 1, the offering company reserves the right to withdraw by notifying the Wells Fargo Bank and Union Trust Co. in writing.

Washington-Virginia Line Sold

The Washington-Virginia Ry., which operates a line connecting Mount Vernon, Alexandria, Washington, D. C., Falls Church and Fairfax Courthouse, has been sold at auction, including equipment, for $575,000. The purchasers represent bondholders and noteholders. It is understood they will operate the road as soon as the sale is confirmed by the court. The property was sold in parcels. Lewis H. Parsons bought the Mount Vernon division, extending from Washington to Mount Vernon, for $300,000; the Falls Church division went to John McMullin of Philadelphia for $150,000; the equipment to John Wayne of Philadelphia for $125,000. The road has 60 miles of track and has been in the hands of receivers since November, 1923.

Railway Construction

Tracks and Yards

ALABAMA.—The Birmingham Southern has been authorized to construct an extension from Ensley to Thomas, in the corporate limits of Birmingham, a distance of 2.4 miles. Estimated cost $301,240.

ARKANSAS.—The Missouri Pacific has awarded a contract to the McGeorge Construction Co., Pine Bluff, Ark., for an extension from a point near Hot Springs, northwest to Mountain Pine, 12 miles, to provide for a lumber development at the latter point.

ARIZONA.—The Santa Fe has been authorized to construct a 15-mile spur from Beardsley. The new line will serve a district of more than 40,000 acres, to be irrigated from the Beardsley-Agua Fria reclamation project, now nearing completion.

CALIFORNIA.—The Southern Pacific, in conjunction with the railroad commission of California, will construct a highway subway near Mossdale, San Joaquin county. The estimated cost, about $75,000, will be borne equally by the state and the railroad.

—The Western Pacific has received authority to construct a branch line extending from a connection with its main line near Kingdon, San Joaquin county, in a westerly direction to a point on the east bank of Little Potato Slough, 7.5 miles, to cost $435,974.

CANADA. — The Temiskaming & Northern Ontario has awarded a contract to Angus & Taylor, North Bay, Ont., for the extension of its line into the Rouyn region of Quebec.

COLORADO. — The Denver & Rio Grande Western has awarded a contract to J. Fred Roberts & Sons, Denver, for change of alignment for a distance of 6 800 ft. on the Pueblo division near Husted. Contracts have been awarded to the Morrison-Knudson Co., Boise, Idaho, for grading and concrete construction in connection with line revision between Minturn and Eagle, 26 miles, to cost approximately $423,500; to the List Construction Co., Kansas City, Mo., for grading and concrete construction in connection with line revision between Brown Canon and Buena Vista, 3 miles, to cost $210,000; to E. W. Wright, Grand Junction, Colo., for grading in connection with the rearrangement of tracks at 13 points between Chacra, and Green River, Utah.

—The Union Pacific has awarded a contract to C. T. Whelan, North Platte, for grading new extensions from Sears on the Limon branch.

IDAHO.—The Northern Pacific has awarded a contract for rebuilding line between Arrow and Oro Fino, 29 miles, to Morrison & Knudson, Boise, Idaho. Estimated cost $400,000.

—The Union Pacific has awarded a contract to the Utah construction Co., for grading for second line track from Minidoka to Dietrick. The track, bridge and signal work will be done by company forces.

ILLINOIS.—The Chicago & Alton, it is said, is revising 5 miles of line at Macoupin, Ill., to reduce the grade on the northbound track, and constructing three miles of second main track. Estimated cost, $400,000.

—The C. M. & St. P. has received authorization from the federal court at Chicago to construct a track connection with the Chicago, Aurora & Elgin at Elgin. Authorization has also been received to purchase 14 acres for the future enlargement of the Blue Island yard which will be undertaken in conjunction with the Indiana Harbor Belt.

MICHIGAN.—The Detroit, Grand Haven & Milwaukee and the Pontiac, Oxford & Northern have been authorized to construct a line extending from a connection with the Detroit's line in a northerly and easterly direction to a connection with the Pontiac's line, 2.48 miles, in Oakland county. The cost of construction is estimated at $315,136 which includes $130,000 for land.

MISSOURI.—The Wabash has awarded a contract to the P. J. Hannan Co., St. Louis, for a steel and concrete viaduct to carry its tracks across Vandeventer avenue at Market Street, St. Louis.

NEBRASKA.—The Union Pacific has been authorized to construct an extension of the southeasterly spur of its Lyman branch, a distance of one mile, in Scotts Bluff county. The estimated cost, including 0.27 miles of siding, is $35,470.

NEW HAMPSHIRE.—The Boston & Maine, it is said, will construct two sidings, 85-car capacity, for north and south bound traffic at Manchester, during the summer.

NEW JERSEY.—The Lehigh Valley has been ordered by the New Jersey board of public utility commissioners to eliminate a grade crossing in Hillsboro township. Estimated cost, approximately $324,000.

—The Pennsylvania has awarded a contract to the Crane Contracting Co., Newark, N. J., for additional tracks for a produce yard at Kearney, to cost about $285,000.

NEW YORK.—The New York Central has awarded contracts to the Lyons-Slattery Co., Inc., New York, for filling for temporary tracks north of Dyckman street, in connection with elimination of grade crossings in New York; for filling for the main line tracks for the south approach to the Dyckman street bridge; and for the duct line and splicing chambers north and south of Dyckman street. A contract has also been awarded to the John Johnston Construction Co., for grading to sub-grade in the area of the new track layout in Buffalo.

—The New York, Westchester & Boston has let contract to Dwight P. Robinson & Co., New York, for extending the double-track, electric lines, of their eastern division to Rye, N. Y.

OHIO.—The Fairport, Painesville & Eastern has been authorized to construct an extension of its line in Lake county, from a point near Painesville, westward to a point near Madison, with a spur extending from a point near the eastern terminus of the proposed extension southeastward to a point near the north bank of the Grand river. The estimated cost of the extension and spur, approximately 8 miles, is $712,193.

—The New York Central is planning to carry out improvements at Port Clinton, to include a cutoff about two miles long and the elevation of its tracks in the village of Port Clinton eliminating grade crossings. This project has been under consideration since about 1912. Delay was due to the time needed to secure the necessary right-of-way. Part of the improvement to its line was carried out several years ago when the railroad built a 4-track lift bridge over the Portage river. The cost will be approximately $2,000,000. The new line will be about 1,500 feet shorter than the old one, and will eliminate a curve that caused reduction of speed at this part of the line.

OREGON.—The Oregon, California & Eastern and Central Pacific have been granted an extension of time from May 3 to June 17 by the I. C. C. for the beginning of construction of new lines proposed by these companies in Southern Oregon, which were authorized conditionally by the commission in a certificate dated May 3, 1926.

SOUTH DAKOTA.—The Chicago & North Western has been authorized to construct a branch line in Butte and Lawrence counties, extending from a connection with one of its main lines at a point about three miles south of Belle Fourche, in a general southwesterly direction 3.5 miles. Estimated cost, $165,000.

TEXAS.—The Quanah, Acme & Pacific has awarded a contract to the Lone Star Construction Co., San Antonio, for grading, bridging and track laying on the extension between McBain and Floydada. Bids will be taken later for stations, buildings and telegraph lines. The estimated cost of the project is $1,132,000.

—The I. C. C. has authorized the San Benito & Rio Grande Valley, a subsidiary of the New Orleans, Texas & Mexico, to build two branch lines in the lower Rio Grande Valley of southern Texas, one extending eastward from Fernando about six miles, and the other extending eastward from San Benito about 18 miles. The San Benito & Aransas Pass, a subsidiary of the Southern Pacific, has been authorized to build an extension from Harlingen to Brownsville, about 30 miles. As the two lines are somewhat parallel the two cases were heard together and the Missouri Pacific opposed the Southern Pacific application. The commission finds that public convenience and necessity require the construction of the lines proposed by both companies notwithstanding some overlapping of service in a part of the territory.

—The Panhandle & Santa Fe has asked the I. C. C. for permission to build a line of 21 miles from White Deer to a point in Hutchinson county.

UTAH.—Denver & Rio Grande Western, see Colorado.

WASHINGTON.—The Port Angeles Western has been authorized to construct part of a proposed extension of its line in Clallam and Jefferson counties from Tyree to Forko. Approximate cost, $1,266,450.

—The Oregon-Washington Railroad and Navigation Co. has prepared plans for additional trackage and improvement to the freight yard at Olympia. Estimated cost, $30,000.

—The Great Northern has awarded a contract to Guthrie & Co., St. Paul, for a cut-off between Winton and Leavenworth, via Plain, to cost about $4,000,000. The project involves the driving of three tunnels and the bridging of the Wenatchee River, and is planned for completion simultaneously with the Cascade tunnel on October 30, 1928.

WEST VIRGINIA. — The Virginian Railway has awarded a contract to W. W. Boxley & Co., Roanoke, for a concrete lining of about 1,071 feet at the east end of Polk Gap tunnel, to cost about $75,000.

WISCONSIN.—The Burlington is constructing a second main track between Diamond Bluff and the North Western crossing, near East Winona, to cost $2,300,000. A contract for grading for parts of this second track has been awarded to the La Crosse Dredge Co., LaCrosse, the material to be dredged from the Mississippi River.

—The Chicago and North Western has awarded a contract to John Marsh, Chicago, for the Wiscona connecting line north of Milwaukee, 1.5 miles long, which will eliminate the present line through White Fish Bay and Shorewood. The concrete structures required will be built by Henry Danischefsky, Milwaukee. The project will cost about $1,500,000, and has been undertaken at the urgent request of the two municipalities which objected to the operation of the railroad through their limits.

Buildings and Structures

ALABAMA. — Anniston. The Southern has awarded a contract to Fairbanks, Morse & Co., Chicago, for a three-track reinforced concrete coaling station of 500-ton capacity.

—Sheffield. The Southern has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 500-ton reinforced concrete three-track coaling station.

—York. The Alabama Great Southern has been ordered by the Alabama public service commission to submit plans and specifications of the station facilities.

ARKANSAS. — Texarkana. Bids have been taken for a union passenger station to be used jointly by the Missouri Pacific, the St. Louis Southwestern, the Texas & Pacific and the Kansas City Southern. The main station building will be two stories high with outside dimensions of 50 feet by 282 feet. The mail and baggage annex will be one-story with outside dimensions of 40 feet by 286 feet. Both structures will be built of reinforced concrete, steel, brick and stone.

CANADA. — Edmonton, Alta. The Canadian National has awarded a contract to the Permanent Construction Co., Edmonton, for a passenger station, to cost about $50,000.

FLORIDA.—Jacksonville. The Southern has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 300-ton steel three-track coaling station with yard storage for 5,000 tons of coal.

GEORGIA. — Atlanta Junction. The Southern has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 800-ton reinforced four-track coaling station.

ILLINOIS.—Casey. The Pennsylvania has closed the bids for two concrete arch bridges near Casey to cost about $50,000.

—Chicago. The Pennsylvania has awarded a contract to the Ready & Callaghan Coal Co., Chicago, for paving and street improvement work at the Fifty-first street subway.

—Galesburg. The Santa Fe, it is said, has prepared plans for a 600,000-gal. reservoir with concrete dam and spillway three and one-half miles north of Galesburg. The company will also construct a four-track concrete coaling station and will make minor track improvements.

—Silvis. The Rock Island, it is reported, is taking bids for additional locomotive repair shop facilities, to cost about $125,000.

KANSAS.—Armourdale. The Rock Island has awarded a contract to the Ogle Construction Co., Chicago, for a two-track electric cinder pit.

—Emporia. The Santa Fe, it is said, is receiving bids for a 40-stall reinforced concrete and brick enginehouse, a planing mill and lumber shed, a one-story apprentice school, a two-story brick locker building, a one-story office building and a brick ice house.

—Marion. The Rock Island has awarded a contract to the Railroad Water & Coal Handling Co., Chicago, for a water-treating plant, with a capacity of 500 gallons per minute, to cost about $30,000.

KENTUCKY. — Lawrenceburg. The Southern has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 300-ton steel two-track coaling station.

MICHIGAN.—Hamtramck. The Grand Trunk Western and the Michigan Central, in conjunction with the city of Hamtramck, are said to have prepared plans for the elimination of a grade crossing, to cost about $1,400,000, of which the two railroads will bear $850,000.

MINNESOTA.—Duluth. The Duluth, Missabe & Northern has awarded a contract to Nauffts & Bergstrom, Duluth, for a two-story dispensary and hospital, to cost $40,000.

—Hollandale. The C. M. & St. P. has received authorization from the federal court at Chicago to construct a cold storage and ice house to cost $80,000. The expense will be shared equally by this company, the Rock Island, and the Albert Lea Farms Co.

—New Brighton. The application of the Soo Lines for the construction of a highway undercrossing has been approved by the Minnesota railroad and warehouse commission.

MISSISSIPPI.—Jackson. The New Orleans Great Northern has awarded a contract to W. J. McGee & Son, Jackson, for a two-story brick passenger station and a one-story brick freight station, to cost about $60,000. This company, it is said, will also ask for bids for a yard office, an automobile shed, and other terminal buildings.

MISSOURI.—Nevada. The Missouri Pacific has awarded a contract to H. O. Hirsch & Co., St. Louis, for a boiler house, to cost about $10,000.

NEW JERSEY.—Newark. The Pennsylvania has announced that it has placed in the hands of Mayor Thomas L. Raymond, of Newark, its plans for proposed improvements in that city, to be made in agreement with arrangements between the city and the Public Service Corpn., an operator of trolley cars and buses, providing for adequate street transit facilities. The improvements include a new passenger station between Market and Canal streets. The western half of the new station will be used by passengers for local and main line trains, and the eastern part for the rapid transit service to Jersey City and downtown New York, provided jointly by the Pennsylvania and the Hudson & Manhattan tubes. Upon completion of these new facilities, Manhattan Transfer, where connection is made with Hudson tunnel trains to downtown New York, will be abandoned. The station will be served by eight tracks, six for Pennsylvania trains and two for rapid transit trains. There will be six platforms. Seven of the tracks and five of the platforms will be placed approximately at the level of the present tracks, and one track and one platform will be constructed about 18 feet above the present track level.

—Newark Bay. The Pennsylvania has awarded a contract to Henry Steers, Inc., New York, for filling for the approaches and yard leading to the proposed bridge between Haverly yard and Greenville yard.

NEW YORK. — East Alexander. The Lackawanna has awarded a contract to James S. McCormick Co., Easton, Pa., for grade elimination, to cost $75,000.

—Harmon. The New York Central has awarded a contract to the Walsh Construction Co., Davenport, Iowa, for grading of a site for an enginehouse.

—Long Island City. The Pennsylvania has awarded a contract to Louis Chevalier, Inc., New York, for a substation at Sunnyside, to cost about $50,000.

—New York City. The New York Central has awarded a contract to James Stewart & Co., Inc., for alterations to present structure, and the construction of overhead roadways along the easterly side of the Grand Central Terminal building and over the Forty-fifth street viaduct. George W. Rogers Construction Co., has been awarded a contract for repairs to the "A" frame at the West Forty-second street ferry slip.

NORTH CAROLINA. — Winston-Salem. The Southern Railway has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 300-ton steel two-track coaling station.

OHIO.—Akron Junction. The Baltimore & Ohio has awarded a contract to the Ogle Construction Co., Chicago, for a 200-ton four-track reinforced concrete coaling station.

—Cleveland. The Nickel Plate has awarded a contract to the Austin Co., Cleveland, for the design and construction of a one-story steel frame warehouse building, with outside dimensions of 80 ft. by 320 ft. at East Forty-fifth street and Woodlawn avenue, to cost about $70,000. An inside loading dock will extend along the total length of the building. The placing of 80,000 cu. ft. of earth in a ravine to provide the roadbed for sidings is included in the contract.

—Greenfield. The Baltimore & Ohio has awarded a contract for the reconstruction of a bridge to the Vang Construction Co., Cumberland, Md. Estimated cost, $52,000.

—Massillon. The Pennsylvania has awarded a contract to the Cleveland Engineering Co., Cleveland, for the reconstruction of three bridges on the branch between Massillon and Clinton.

—Toledo. The Pennsylvania has awarded a contract to the Ferguson & Edmondson Co., Pittsburgh, for an undergrade bridge to eliminate a grade crossing at Main Street. Estimated cost $200,000.

OREGON. — Portland. The Oregon-Washington Railroad & Navigation Co., it is said, is planning the construction of a 200,000 bu. grain elevator with a 200 ft. dock. Estimated cost, about $180,000.

PENNSYLVANIA. — Lewiston. The Pennsylvania has awarded a contract for an overhead bridge to M. J. McMenamin of Philadelphia, to cost about $70,000.

Philadelphia. The Philadelphia Perishable Products Terminal, built by the Baltimore & Ohio and Philadelphia & Reading at a cost of $4,000,000, was officially opened May 10. In honor of the occasion an informal luncheon was given by the railroad officials to a large number of city officials and members of the

fruit and produce trade. The auction sales building, the first of the three units of the plant, was opened last November and the team delivery yard, with a capacity of 360 cars, has since been put in use. The refrigerated space made available by the cold storage warehouse covers an area of 1,300,000 cubic feet and the entire terminal now takes its place as one of the largest, most complete and modern of its kind in the country.

SOUTH CAROLINA.—Columbia. The Southern Railway has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 1,000-ton reinforced concrete four-track coaling station.

TENNESSEE.—Bulls Gap. The Southern Railway has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 600-ton reinforced concrete three-track coaling station.

—Coster. The Southern Railway has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 500-ton reinforced concrete two-track coaling station.

—Yale. The St. Louis-San Francisco, it is said, is receiving bids for a 24-stall enginehouse.

TEXAS.—Harlingen. The Gulf Coast Lines have awarded a contract to the Summer Sollitt Co., for a reinforced concrete, steel, and brick freight station, to cost about $57,000. The contract includes a concrete platform covered with a steel frame shed.

VIRGINIA.—Monroe. The Southern Railway has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 1,000-ton reinforced concrete three-track coaling station.

WEST VIRGINIA.—Martinsburg. The Baltimore & Ohio has awarded a contract to the Empire Construction Co., Baltimore, for grading, masonry, and for additional freight facilities, to cost $29,000.

WISCONSIN.—Tomah. The C. M. & St. P. has received approval from the federal court at Chicago to enlarge its concrete products plant, at a cost of $30,000.

Locomotive Orders

In our last issue we stated that locomotive orders in May would show considerable improvement over the previous months of this year because of the large number of inquiries that were out. This forecast has more than proved true, our reports showing that a total of 198 engines were ordered during the month, almost as many as were ordered during the entire first four months of the year when we recorded only a total of 214. This increase was due largely to the orders placed by the Erie, New York Central, Central of New Jersey and Lackawanna. At the time of going to press there are not many inquiries pending. The Lehigh & New England and the Peoria & Pekin Union are said to be in the market for six and three eight-wheel switchers respectively. The Great Northern, it is said, will buy 10 more electric engines, and there are a few scattering inquiries for locomotives for export.

From January 1 to the date of our going to press orders have been received by the locomotive builders for a total of 412 engines. A complete list of these orders follows:

Purchaser	No.	Type	Builder
Alab. State Docks	1	Switching (6)	Amer.
Apalachicola Nor.	1	4-6-0	Amer.
A. T. & S. F.	10	Santa Fe	Bald.
Bang. & Aroostook	5	Pacific	Amer.
Barber Asphalt	1	Switching (6)	Bald.
Can. Nat'l for Grnd Trunk	12	4-8-4	Amer.
	10	Switching	Lima
Central of N. J.	5	Pacific	Bald.
	10	Switching (8)	Bald.
Central Vermont	4	4-8-2	Amer.
Chicago & Ill. Midl.	2	Amer.	Bald.
Chicago, N. S. & M.	2	Electric	Gen. Elect.
C. & N. W.	13	2-8-4	Amer.
	8	Switching (8)	Amer.
	1	60 Ton Diesel Elec. Switching	Amer.
Chicago, S. S. & S. B.	2	Electric	West.
C. B. & Q.	12	2-10-4	Bald.
Comm. Edison	1	Switching (6)	Lima
D. & R. G. W.	10	Mallet	Amer.
Del., Lack. & W.	10	Mountain: 3 cyl.	Amer.
	5	4-8-4	Amer.
Dul., Miss. & Nor.	4	Switching (10)	Bald.
Erie	30	Switching (8)	Bald.
	25	2-8-4	Amer.
	25	2-8-4	Lima
Ferrocar'l de Antioquia Colombia	1	Mikado	Bald.
Gulf Coast	5	Switching (8)	Amer.
	6	Pacific	Amer.
Gulf, Mobile & Nor.	4	Decapod	Bald.
Huntington & B. T.	2	Consolid'n	Bald.
Illinois Central	15	Switching (8)	Bald.
Inland Steel	1	Switching (6)	Bald.
Intern'l Lumber	1	Switching (8)	Bald.
Internat'l & G. N.	5	Switching (8)	Amer.
Lehigh & Hudson	2	Consolid'n	Bald.
Mich. L. & Chem.	2	Switching (6)	Lima
Minn. Dakota & W.	1	Switching (8)	Bald.
Misouri Pac.	5	Mountain	Amer.
	15	Switching (8)	Amer.
Mobile & Ohio	5	Switching (6)	Amer.
Monongahela	6	Mikado	Bald.
Mukden & Hailung	4	Mogul	Bald.
New Eng. F. & T. Co.	1	Switching (8)	Amer.
New Orleans G. N.	3	Mountain	Amer.
New York Cen'l	1	Switching	Amer.
	60	Hudson	Amer.
N. Y., N. H., & H.	6	3 cyl. switching (8)	Amer.
Oliver Iron M. Co.	10	Switching (8)	Lima
Pickands-Mather	2	Switching (6)	Lima
Sorocabana Ry.	10	4-8-2; 3 cyl.	Amer.
Southern Pac.	10	4-10-2; 3 cyl.	Amer.
Texas & Pac.	15	2-10-4	Lima
Toledo, Peoria & W.	4	Mikado	Amer.
Youngstown & Nort'n	2	Switching (6)	Amer.

In addition to the foregoing several orders have been placed for locomotive tenders only. The New York Central ordered 55 of 15,000 gal. capacity from the American Locomotive Co., and the Norfolk & Western has decided to build 30 in its own shops.

Passenger Car Orders

Passenger car orders and inquiries in May again showed tremendous activity after the lull which occurred during April. The outstanding order was that of the New York Central Lines for a total of 175 cars for passenger train service. Our records now show that over 1187 cars have been ordered this year, up to June 1, for passenger service. This is an increase of about 50 per cent over orders for the same period of last year. The New York Central order was divided among the builders as follows: Pullman Car & Mfg. Corp., 60; American Car & Fdry. Co., 49; Standard Steel Car Co., 28; Pressed Steel Car Co., 28, and Osgood-Bradley Car Co., 10.

Other orders placed during the month were as follows: Lackawanna, 20 milk to Standard Steel Car Co., 10 express to American Car & Fdry. Co., and two combination mail & baggage to Pullman; Central of New Jersey, 25 coaches to Bethlehem Steel; New Haven, 20 baggage to Osgood-Bradley; Chicago & Illinois Midland, six coaches to Pullman; Santa Fe, three parlor cars to Pullman; Paulista Ry. of Brazil, 20 miscellaneous cars to American Car & Fdry.; Interstate Public Service Co., six interurban to G. C. Kuhlman; Galveston Electric Co., four double-end electric; El Paso Electric Co., seven 39-foot electric cars to American Car Co. The last three mentioned orders are all to be equipped with Brill type 177-EX trucks.

Inquiries which developed during the month were as follows: Erie, four steel diners; Norfolk & Western, 25 steel mail cars; Burlington, four lounge cars; Reading, 15 baggage cars and two horse cars; Illonois Central, 16 combination baggage and express and baggage and mail cars. In addition to these there are several sizeable inquiries out for self-propelled and electric cars such as the Seaboard Air Lines for some 20 gas-electric cars and 20 trailers and the St. Paul's for 10.

Freight Car Orders

In our last issue we stated that while freight car buying had been slow for the first few months of the year it still was about equal to the same period in 1926, but that we looked for the release of some larger orders during May and heavier buying during the last part of this year than in 1926. The proposed orders for the New York Central and Lackawanna which we referred to have been placed and in addition the Illinois Central entered the market for a total of 4500 cars. If the Illinois Central purchases the cars on inquiry it will bring the total ordered for this year up to over 38,000. The New York Central Lines order totaled 3350 and it was divided among the builders as follows: Standard Steel Car, 1000; Pressed Steel Car, 1000; American Car & Fdry., 1050 and General-American, 500. Other orders during the month were as follows: Reading, 500 gondolas to Bethlehem Steel and 500 to Standard Steel Car; Lackawanna, 300 55-ton box and 300 70-ton hoppers to American Car & Fdry.

and 200 box to Magor Car. The Clark Car Co. of Pittsburgh received orders for 2 21-cubic yard extension side dump cars from the Spokane, Portland & Seattle; 10 similar cars, from the Southern Pacific and 6 30-yard cars from the Pacific Gas & Electric Co.

The Illinois Central inquiry was for 2000 box cars, 1000 50-ton gondolas, 700 50-ton hoppers, 300 70-ton hoppers and 500 50-ton flat cars. The Western Pacific sent out inquiries for 40 30-yard dump cars, the Union Pacific for 6 20-yard cars, and the Minnesota Steel Co. for six of 30-yard capacity.

Bus & Truck Orders

A statement released May 23 by the department of commerce, based on reports received from 121 manufacturers in the United States, shows that in April, 44,495 trucks were produced (factory sales). The statement further shows that for the first four months of 1927 a total of 165,021 trucks were produced, compared with 150,586 for the same four months in 1926. The department includes ambulances, funeral cars, fire apparatus, street sweepers and buses in the classification of trucks. The Dominion bureau of statistics reports that 3,721 trucks were built in Canada in April as compared with 3,543 in March and 3,573 in April, 1926.

The International Motor Co., New York City, reports having received recently the following orders for new buses: Dillon Coach Lines, Fulton, N. Y., 10 25-passenger city type for use in Oswego; Spring Valley Motor Coach Co., Inc., Spring Valley, N. Y., two 29-passenger parlor cars; Parlor De Luxe Coach Co., Ocean City, N. J., 2 25-passenger parlor cars; Boro Buses Co., Red Bank, N. J., one 29-passenger city type; Index Stages Inc., Monroe, Wash., one 29-passenger city type; Iowa Southern Utilities Co., Burlington, Ia., one 25-passenger city type; North Texas Coach Co., Wichita Falls, one 25-passenger parlor car; Jones Motor Co., Spring City, Pa., one 25-passenger city type; Binghamton Railway Bus Lines, Binghamton, N. Y., one 25-passenger city type; Boston Elevated Railway, Boston, one 29-passenger city type; Lead-Deadwood Transit Co., Lead, S. Dak., one 25-passenger city type. In addition to these orders 10 buses have been purchased during the past month by operators for runs along the Hudson county boulevard in New Jersey.

The Union Pacific has ordered three 27-passenger parlor car buses from the American Car & Foundry Motors Co. for use on the Pendleton-Portland route.

The Central of New Jersey has ordered two parlor car buses of 27-passenger capacity from the American Car & Foundry Motors Co. for use on its Lakewood-Barnegat line. See item under general news about this route.

Current Ship Building

On May 1, 1927, American shipyards were building or under contract to build for private shipowners 221 steel vessels of 206,337 gross tons compared with 260 steel vessels at 252,377 gross tons on April 1, 1927, according to the bureau of navigation, department of commerce. There were 55 wood vessels of 28,923 gross tons building or under contract to build for private shipowners during the same period compared with 60 wood vessels at 35,562 gross tons on April 1.

Contracts for 22 new boats were made during May totaling 10,633 gross tons according to reports received by the department of commerce. Builders reporting were: American Bridge Co., 5; American Brown, Boveri Elect. Corpn., 2; Gildersleeve S. B. Co., 5; Jakobsen & Petersen, 2; Midland Barge Co., 5; Wm. Muller, 1; Sim Shipbuilding Co., 2.

Changes in Personnel

Executive & Operating

The board of directors of the American Railway Association, following the regular meeting in Atlantic City, May 26, announced approval of the appointment of **Harry G. Taylor,** chairman of the Nebraska state railway commission as manager of public relations of the car service division, American Railway Association, effective July 1. **Mr. Taylor** will succeed **Donald D. Conn.**

William E. Mitchell has been elected vice president and general manager of the Georgia Power Co., to succeed **W. H. Taylor,** who resigned a short time ago to become vice president of the United Gas Improvement Co.

M. McCants has been appointed vice-president in charge of transportation of the Market Street Ry. of San Francisco.

J. D. Brennan has been appointed assistant superintendent, Western division of the Southern Pacific with headquarters at West Oakland. **F. J. Foley** has been appointed assistant superintendent, Shasta division, with headquarters at Dunsmuir; and **A. A. Lowe** has been appointed trainmaster, Coast division, with headquarters at San Francisco.

J. M. Yount has been appointed vice president in charge of equipment and maintenance of the Market Street Ry. of San Francisco. He will have charge of all work connected with shops, tracks, overhead lines, cables and substations. Messrs. **Legare, Bivins, Foster, Peterson** and **Delaney** will report to Mr. **Yount. J. W. Delaney,** effective May 11, was appointed superintendent of equipment. **F. W. Allen,** formerly superintendent of the Geneva division has been appointed commercial manager. **E. H. Lincoln,** assistant superintendent of the McAllister division succeeds **Mr. Allen.**

Harry W. Zook has been appointed president of the Steelton & Highspire R. R. at Steelton, Pa.

H. G. Clark, assistant to the president of the Rock Island has been elected vice president with headquarters at Chicago. **Frank E. Walsh,** secretary to the president, has been appointed assistant to the president. **Arthur Mackenzie,** freight traffic manager, has been elected vice president with the title of vice president and freight traffic manager.

F. H. Porter, vice president and general manager of the Santa Fe Northwestern, has been elected president, succeeding **G. A. Porter,** deceased.

George P. McNear, Jr., general manager of the Toledo, Peoria & Western, has been elected president following the discharge of the receivership.

T. H. Steffens, vice president of the Sand Springs Ry., has been elected president succeeding **Chas. Page,** deceased. **F. M. Monsell,** acting treasurer, has been elected vice president and treasurer. **E. A. Page** has been elected second vice president.

S. P. Henderson, superintendent of the Chicago & Alton, has been appointed general superintendent with headquarters at Bloomington, Ill., succeeding **W. H. Penrith,** who has resigned to become associated with a firm of railroad contractors at Chicago. The jurisdiction of **J. L. Marquette,** superintendent of the western division has been extended to include the line from Roodhouse to Bloomington, including Bloomington Yard, with headquarters at Bloomington. **J. J. Butler** has been appointed superintendent of the northern and southern divisions, with the exception of Roodhouse to Bloomington, with headquarters at Bloomington. Other appointments are as follows: **G. C. Brown,** assistant superintendent on the western division

with headquarters at Slater, Mo.; **D. J. Deasy,** trainmaster at Bloomington, succeeding **J. E. Farrell,** who has been granted leave of absence.

The C. M. & St. P. announces the following promotions: **D. W. Kelly,** general superintendent, middle district, with headquarters at Milwaukee; **N. A. Ryan,** superintendent of the Chicago-Milwaukee division, with headquarters at Milwaukee; **A. J. Elder,** superintendent of Terre Haute division, with headquarters at Terre Haute; **F. T. Buechler,** superintendent of Sioux City & Dakota division, with headquarters at Sioux City; **M. J. Gruber,** assistant superintendent of Twin City Terminal division, with headquarters at Minneapolis.

D. Van Hecke, superintendent of the Panhandle-Indian Territory division of the Rock Island, has been appointed superintendent of the newly created Panhandle division, with headquarters at Amarillo. **J. Sewell,** assistant to the general manager of the second district, has been appointed superintendent of the newly created Indian Territory division, with headquarters at **El Reno.**

C. G. Sibley, superintendent of transportation of the second division of the Atlantic Coast Line, at Savannah, has been appointed general superintendent of the first division, with headquarters at Rocky Mount, N. C., succeeding **W. H. Newell,** retired. **J. A. Wall,** superintendent at Waycross, Ga., succeeds Mr. Sibley at Savannah. Other appointments are as follows: **D. E. McLeod,** superintendent of the Waycross district; **E. S. Blackburn,** trainmaster at Waycross; **J. K. Kuijk,** terminal trainmaster of the Savannah district, and **W. L. Barefoot,** chief dispatcher at Savannah.

M. E. Collins has been appointed assistant to the general manager of the Edmonton, Dunvegan & British Columbia, with headquarters at Edmonton, Alta. **J. E. Deakin** has been appointed assistant superintendent, with headquarters at Edmonton.

J. W. Slack, Jr., supervisor of the wage bureau of the Long Island, has been appointed passenger train master, steam lines, succeeding **H. E. Lewis,** deceased. **C. J. Blanthorn** succeeds Mr. Slack.

E. G. Evans, assistant superintendent of the South & North Alabama, Birmingham Mineral and Alabama Mineral divisions of the Louisville & Nashville, has been appointed superintendent of safety, with headquarters at Louisville. **J. E. Brownville** succeeds Mr. Evans as assistant superintendent, with headquarters at Birmingham.

J. J. Woods, supervisor of stations of the Nickel Plate and Lake Erie and western districts of the Nickel Plate, has been appointed general supervisor of stations with headquarters at Cleveland. The position of supervisor of those two districts of the road has been abolished.

H. A. Moynihan, superintendent of the old Colony division of the New Haven, with headquarters at Taunton, Mass., has been appointed superintendent of the Providence division, with headquarters at Providence, succeeding **G. A. Poore. H. E. Astley,** superintendent of the Midland division, with headquarters at Boston, succeeds Mr. Moynihan as superintendent of the Old Colony division. **J. J. Snavely,** superintendent of the Waterbury division, has been appointed superintendent of the Midland division; **R. O. Hanley,** assistant superintendent of the Boston division, has been appointed superintendent of the Waterbury division succeeding Mr. Snavely; and **W. S. Carr,** has been appointed assistant superintendent of the Boston division.

H. B. Shoemaker has been appointed assistant superintendent and supervisor of track of the Valley branch of the New York Central, with headquarters at Dunkirk, Ohio.

Thomas H. Carrow, the safety specialist of the Pennsylvania, has been promoted to the newly created position of superintendent of safety, reporting to the vice president in charge of personnel; headquarters at Philadelphia. **J. G. Dennis,** assistant trainmaster, Pittsburgh division of the Pennsylvania, with headquarters at Pitcairn, Pa., has been appointed freight trainmaster, Panhandle division, with headquarters at Pittsburgh. **E. C. Gegenheimer,** assistant engineer, has been appointed assistant trainmaster of the Columbus division. **P. C. Bauer,** assistant trainmaster, Indianapolis division, has been appointed assistant trainmaster and division operator, St. Louis division. **H. L. Clapper,** assistant trainmaster, Chicago terminal division, has been appointed assistant trainmaster, Indianapolis division.

E. E. McCarty has been appointed superintendent of the Albuquerque division of the Santa Fe with headquarters at Winslow, Ariz.

F. E. Slater, chief clerk, of the Southern Pacific, with headquarters at San Francisco, has been appointed supervisor of transportation, with headquarters at the same point, succeeding **T. B. Wilson,** who has accepted service with a subsidiary company. **R. N. Gardner** succeeds Mr. Slater as chief clerk. Other promotions are as follows: **V. S. Burnham,** trainmaster western division, headquarters at Suisun, Cal.; **J. M. Trefren,** trainmaster Tucson division, headquarters at Yuma; **C. G. Tandy,** trainmaster Stockton division, headquarters at Tracy, Cal.; **S. H. Bray,** trainmaster San Joaquin division, headquarters at Mojave; **T. W. Cardwell,** trainmaster Salt Lake division, headquarters at Carlin, Utah.

N. P. Berney has been appointed supervisor of transportation, Northern district, with headquarters at Sacramento.

R. W. Cattermole, superintendent and chief engineer of the Tonopah & Goldfield, with headquarters at Goldfield, has been appointed general superintendent, with headquarters at the same point.

Financial and Legal

James P. Pratt, assistant regional counsel of the central region of the Canadian National, has been promoted to regional counsel, with headquarters at Toronto, succeeding **A. J. Reid,** deceased. **Robert E. Laidlaw** succeeds Mr. Pratt as assistant regional counsel.

Robert B. Tunstall has been appointed assistant general counsel of the Chesapeake & Ohio and the Hocking Valley with headquarters at Richmond, Va. **C. R. Lowry** has been appointed assistant attorney.

W. H. Simpson has been appointed auditor of the Fort Smith & Western, with headquarters at Forth Smith, Ark., succeeding **H. B. Herendeen, deceased.**

J. N. Flowers, special attorney of the Gulf, Mobile & Northern, has been appointed general solicitor, with headquarters at Mobile, succeeding **Joseph C. Rich,** deceased.

The Pennsylvania Railroad announces the promotion of **J. Gordon Watson** to the position of assistant secretary, a position he holds in a number of subsidiary companies in the Pennsylvania System.

W. P. Dolan, of the general manager's staff of the Santa Fe Coast Lines, has been appointed car accountant, with office at Los Angeles, succeeding **Col. S. M. Saltmarsh,** deceased.

Guy V. Shoup, general solicitor of the Southern Pacific, with headquarters at San Francisco, has been placed in charge of the legal department, succeeding **William T. Herrin,** deceased. The position of chief counsel and vice president has been abolished. **C. W. Durbrow,** an attorney in the legal department, has been appointed valuation counsel with headquarters in San Francisco.

E. T. Miller, general solicitor of the St. Louis-San Francisco has been appointed to the newly created office of vice president and general solicitor.

F. L. Fox, treasurer for the receiver of the Toledo, Peoria & Western, has been elected treasurer following the discharge of the receivership. **G. A. Gladson** has been elected secretary.

Purchases and Stores

E. A. Workman, stores manager of the Central of New Jersey at New

York, has been appointed manager of purchases and stores, the two departments having been consolidated. **C. B. Williams**, purchasing agent has been granted an extended leave of absence on account of ill health.

Eugene Decker has been appointed purchasing agent of the Maine Central with headquarters at Portland, Me., succeeding **Chas. D. Barrows**, deceased..

A. E. Owen, assistant purchasing agent of the Pennsylvania, with headquarters at Chicago, has also been appointed purchasing agent of the Chicago Union Station Co., succeeding **W. G. White, Sr.**, who will continue in his capacity as secretary.

Traffic

P. S. Eustis, passenger traffic manager of the Burlington has retired after serving the company for over 50 years. He is succeeded by **Albert Cotsworth, Jr.**, who has held the position of general passenger agent. **John R. Van Dyke**, general agent in the passenger department at Chicago succeeds **Mr. Cotsworth.**

W. R. Seden, chief clerk to the assistant freight traffic manager of the Great Northern, has been appointed assistant general freight agent, with headquarters at St. Paul.

J. M. Francis has been appointed freight claim agent of the Lehigh & New England with headquarters at Bethlehem, Pa., succeeding **E. W. Drinker**, retired.

Frank W. Libby has been appointed traveling freight agent of the Maine Central, reporting to the commercial agent at Lewiston, Me.

W. H. Thompson, assistant general freight agent of the Missouri Pacific, has been appointed general freight agent. **T. B. Duggan** succeeds Mr. Thompson as assistant general freight agent. Headquarters at St. Louis.

H. T. Rickerson has been appointed general agent, freight department, of the New York Central Lines with headquarters at 627 Hibernia Bank building, New Orleans, succeeding **A. C. Huggins**, resigned.

Ralph C. Kerr, division freight and passenger agent of the North Western at Green Bay, Wis., has been promoted to assistant general freight agent, with headquarters at Chicago.

F. L. Gannaway, general agent of the Burlington at Indianapolis, has been transferred to Detroit, succeeding **F. C. Board**, deceased. **O. G. Hagemann**, traveling freight agent, has been appointed general agent at Indianapolis, succeeding Mr. Gannaway.

Paul H. Pearson has been appointed assistant to the passenger traffic manager of the Boston & Maine with headquarters at East Cambridge, Mass.

L. C. Jorgenson, assistant traffic manager of the Green Bay & Western, the Ahnapee & Western and the Kewaunee, Green Bay & Western, has been appointed traffic manager, with headquarters at Green Bay, Wis.

E. E. Nelson, assistant general passenger agent of the Northern Pacific, with headquarters at Seattle, has been appointed assistant passenger traffic manager with headquarters at St. Paul. **R. J. Tozer**, general agent for the Orient, with headquarters at Shanghai, China, succeeds Mr. Nelson at Seattle. **J. J. Heron**, assistant to the freight traffic manager with headquarters at St. Paul, has been appointed assistant general freight agent, with the same headquarters. **J. P. Dennis**, chief clerk to the assistant freight traffic manager, succeeds Mr. Heron. **C. E. McMillen**, soliciting freight agent at Butte, has been appointed general agent at the same point succeeding **J. S. Kemp**, retired. **A. J. Dexter**, a county agent for South Dakota, has been appointed a representative of the agricultural department, with headquarters at St. Paul. Mr. Dexter will engage in agricultural development activities in North Dakota and Minnesota.

Vincent P. Summerfield, assistant general agent of the Pennsylvania with headquarters at Philadelphia, has been appointed general freight agent, with headquarters at the same point. **J. L. Webb**, passenger agent, Pennsylvania New York, has been promoted to superintendent of stations and transfers, central region, with headquarters in Pittsburgh. **Charles H. Haggerty, division** passenger agent at Louisville, has been promoted to general agent at Louisville.

J. J. Bloomer has been appointed general agent of the Pittsburg & West Virginia and the West Side Belt, with headquarters at Chicago.

George Cooley, chief clerk in the baggage department of the Reading, has been promoted to general baggage agent, with headquarters at Reading Terminal, succeeding **Harry W. Souders**, deceased.

S. A. Hughes has been appointed colonization agent for the St. Louis-San Francisco at St. Louis. **Ralph E. Bowden**, city passenger agent at Chicago, has been appointed traveling passenger agent with headquarters at Detroit and is succeeded by **Frank Shay**, formerly secretary to the passenger traffic manager, St. Louis.

T. H. Warrington, who for the past 33 years has been in the service of the Santa Fe, has retired as general agent at Sacramento, owing to ill health. **Elmer B. Johnson**, succeeds Mr. Warrington. **F. A. Bell**, division freight and passenger agent at Stockton, has been appointed division freight agent at Oakland, succeeding **W. J. Shattuck**, who is retiring on account of ill health. **E. J. Platt**, traveling freight and passenger agent at Sacramento, succeeds Mr. Bell at Stockton.

H. E. Mack, manager of mail traffic of the Texas & Pacific, has had his jurisdiction extended to include the management of express traffic.

Breckenridge Armstrong has been appointed assistant general passenger agent of the Union Pacific System, with headquarters at Omaha. **T. I. McGrath** has been appointed acting district freight and passenger agent with headquarters at Tacoma.

Charles Thorburn, soliciting freight agent, St. Louis territory, of the St. Louis-San Francisco has been promoted to traffic manager of the Muscle Shoals, Birmingham & Pensacola, a 'Frisco subsidiary, with headquarters at Pensacola, succeeding **Gordon L. Oliver** who has been promoted to traffic manager of the Frisco's Texas Lines, with headquarters at Fort Worth. **Mr. Oliver** replaces **W. C. Preston**, resigned.

W. A. Westington has been appointed terminal agent of the Southern Pacific at San Francisco, with jurisdiction in a supervisory capacity, over the following agencies: San Francisco, Fourth and Berry streets; San Francisco, Drumm street; Bay Shore; South San Francisco; Colma and San Bruno. **J. G. Dahlstrom** has been appointed agent, San Francisco freight station.

Mechanical

J. W. Delaney has been appointed superintendent of equipment of the Market Street Ry. of San Francisco. For other appointments see item under Executive and Operating.

John W. McVey, supervisor of locomotive performance, for the Boston & Maine, with headquarters at Boston, has been appointed master mechanic, with headquarters at East Somerville. **Daniel J. Ayers**, master mechanic with headquarters at Woodsville, N. H., succeeds Mr. McVey. **Edward J. Dwyer** has been appointed master mechanic, White Mountains-Passumpsic and Connecticut River divisions, with headquarters at Springfield. **Walter H. Ohensorge** has been appointed master mechanic, Fitchburg-Berkshire division, with headquarters at East Deerfield.

H. C. Gugler, master mechanic on the Burlington, with headquarters at Sheridan, Wyo., has been transferred to the Hannibal division with headquarters at Hannibal, Mo.

John McFayden, master mechanic of the British Columbia district of the Canadian Pacific, with headquarters at Nelson, B. C., has been transferred to Vancouver, B. C., succeeding **W. H. Evans,**

retired. **Palmer S. Lindsay,** master mechanic of the Manitoba district, succeeds Mr. McFayden, at Nelson.

William Landess, chief electrician in charge of electrical maintenance of the Chicago Union Station Co. at Chicago, has been appointed assistant mechanical superintendent with supervision over all mechanical and electrical matters.

E. M. Jenkins, chief draftsman, car department of the Lackawanna, has been appointed master car builder with headquarters at Scranton, succeeding Peter Alquist, deceased.

D. Turner has been appointed master mechanic of the Edmonton, Dunvegan & British Columbia with headquarters at Edmonton, Alta.

John W. Griffiths has been appointed superintendent of motive power of the Guantanamo Western with headquarters at Guantanamo, Cuba.

J. C. Menzel, master mechanic of the Altoona machine shops of the Pennsylvania, has been appointed assistant to the works manager. **O. N. Edmondson,** general foreman of the Juniata erecting and machine shops, succeeds Mr. Mengel.

Civil

W. L. Connors, assistant signal engineer of the Buffalo, Rochester & Pittsburgh, has been appointed signal engineer with headquarters at Rochester, succeeding **E. W. Kolb,** who has resigned to accept employment with the General Railway Signal Co. **C. R. Happ,** signal inspector, has been appointed signal supervisor with headquarters at Punxsutawney, Pa., succeeding **G. H. Person,** transferred to Du Bois.

L. H. Robinson has been appointed division engineer of the Halifax division of the Canadian National, with headquarters at Halifax. **G. W. H. Perley** has been appointed division engineer of the Campbellton division, succeeding Mr. Robinson. **Ronald McIsaacs** succeeds Mr. Perley as division engineer of the New Glasgow division. **F. W. Leeper,** division engineer on the British Columbia district, with headquarters at Prince Rupert, has been transferred to the Saskatchewan district, with headquarters at Saskatoon.

Joseph A. Andreucetti, assistant electrical engineer of the Chicago & North Western, has been appointed electrical engineer, succeeding **A. J. Farrelly,** retired. **W. H. Chapman,** first electrical inspector, has been appointed assistant electrical engineer.

C. F. Allen, roadmaster on the Chicago and Milwaukee division of the C. M. & St. P., has been appointed division engineer, with headquarters at Milwaukee.

Charles Eisele has been appointed general supervisor of bridges of the New York Central Lines west of Buffalo, with headquarters at Cleveland, succeeding **George E. Bitz,** deceased.

Porter Allen, superintendent of the eastern division, central region, of the Pennsylvania, has been promoted to chief engineer maintenance of way, western region, with headquarters at Chicago, to succeed the late **W. L. Ekin.** Mr. Allen was born at Williamsport, Pa., in 1880 and educated at Mercersburg Academy and Lafayette College. He entered the railroad's service in 1902 as rodman and served on various divisions in that capacity and as transit man and supervisor. He became division engineer, Cleveland & Pittsburg division, in 1902, superintendent South Bend division in 1923 and superintendent of the Norfolk division in 1924. He has been in his present position since last September.

F. F. Hewes, division engineer on the Santa Fe, with headquarters at Slaton, Texas, has been appointed office engineer with headquarters at Chicago, succeeding **J. deN. Macomb,** who has resigned to become assistant to the vice president in charge of railway sales of the Inland Steel Co., Chicago. **Thomas Blair,** succeeds Mr. Hewes at Slaton. **Donald K. Crawford,** general signal supervisor on the western lines with headquarters at La Junta, has been appointed assistant signal engineer. **A. M. Staley,** signal supervisor at Las Vegas, N. M., succeeds Mr. Crawford as general signal supervisor.

B. F. Cary has been appointed bridge and building supervisor, and **G. W. Welker,** assistant bridge and building supervisor, Washington division of the Southern, with headquarters at Alexandria, Va. Appointments are as follows: **C. W. Russell,** acting track supervisor, Richmond division, headquarters at Keyesville, Va.; **A. Lyon,** track supervisor, Knoxville to Ooltewah, Tenn., headquarters at Cleveland, Tenn.; **W. C. Kidwell,** track supervisor, MP. 27C to Fonde, Ky., headquarters at Coal Creek, Tenn.; **W. H. Wood,** track supervisor, Knoxville to Cumberland Gap, Tenn., headquarters at Knoxville; **C. G. Smith,** track supervisor, MP. 225 to 284, Danville division, headquarters at Greensboro, N. C.

Obituary

S. P. Alquist, master car builder of the Lackawanna, with headquarters at Scranton, Pa., died of heart disease May 4, while en route to Grand Rapids, Mich., on a Michigan Central train.

F. B. Brown, general auditor of the Cincinnati, Indianapolis & Western, died at his home in Indianapolis May 6.

William H. Brill, general passenger agent of the Illinois Central, at New Orleans, died in that city May 20, after an illness of about three months.

William S. Dawley, consulting engineer, with offices at St. Louis, died aboard a train leaving the Tower Grove station in that city May 18. Mr. Dawley was formerly chief engineer of the Chicago & Eastern Illinois and the Yunnan-Szwchuan & Tengyneh Railway of China.

Arthur W. Trenholm, former vice president of the Chicago, St. Paul, Minneapolis & Omaha, who retired from active service in 1925, died at his home at St. Paul of cerebral hemorrhage, May 13.

H. G. Maney, assistant controller of the Nashville, Chattanooga & St. Louis, died in Nashville, April 19, of bronchial pneumonia.

J. A. Weitzel, assistant road foreman of engines of the Columbus division of the Pennsylvania, died April 22, aged 56.

G. E. Parks, mechanical engineer of the Michigan Central, died at the Harper Hospital at Detroit, May 15.

William L. Ekin, chief engineer maintenance of way of the western region of the Pennsylvania, died of heart disease in his office at the Union Station, Chicago, April 28.

H. B. Herendeen, auditor of the Fort Smith & Western, died May 16.

William C. Wood, Jr., district freight and passenger agent for the Pennsylvania at Memphis, died May 17.

F. F. McCauley, superintendent of the Galena division of the Chicago & North Western, died at his home in Chicago May 17.

Horace E. R. Wood, retired treasurer and assistant secretary of the Chicago & Alton, died at Oakland, Cal., April 29, after a short illness, aged 72.

George C. Murray, formerly president of the Keyoke Railway Equipment Co. of Chicago died May 22.

Frederick H. Thatcher, eastern district sales manager of the Worthington Pump & Machinery Corpn., died at Cincinnati May 2.

W. H. Schoepf, president and chairman of the board of the Cincinnati Car Co., died May 6, following a heart attack.

William E. Holstock, 67 years old, superintendent of transportation on the Syracuse lines of the New York State Rys., died on May 5.

George E. Maltby, vice president of the Jamestown Street Ry., the Jamestown Motor Bus Transportation Co. and the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., died unexpectedly at Los Angeles, April 29.

Supply Trade Notes

H. A. Couse, a member of the law department of the **General Electric Co.**, has been appointed general counsel of the incandescent lamp department, with offices at 120 Broadway, New York. **Phillip D. Reed** will be associated with Mr. Couse at his New York office.

Carl B. Woodworth has been appointed manager of the western division of the **Vanadium Corpn.** of America with headquarters at Chicago. "Woody," as he is known to the industry, served as captain of engineers for 15 months with the A. E. F. on railroad work in France. He was graduated from the mechanical engineering department of Purdue University in 1907 after which he was employed for nine years in various capacities, from machinist to general foreman, in the mechanical departments of the Wabash and the Baltimore & Ohio railroads. After the war he spent six years as representative of the American Locomotive Co. in Argentine and Brazil.

The **Davis Brake Beam Co.**, Johnstown, Pa., has moved its Pittsburgh office from 427 Oliver Building to its own building at 418 Sixth avenue.

John A. Coakley, assistant to the vice president of the **American Steel & Wire Co.**, has been appointed general traffic manager, with headquarters at Cleveland.

The **Whiting Corpn.**, Harvey, Ill., has appointed **Brazelton, Wessendorff & Nelms, Inc.**, Houston, as sales agents to handle the Whiting line of cranes, foundry equipment and railroad specialties in southeastern Texas.

The **Youngstown Sheet & Tube Co.**, and the **Youngstown Steel Products Co.**, have moved their district sales office to suite 214-220 Continental Oil building, Denver.

Charles M. Schramm, assistant to the vice president of the **Vapor Car Heating Co.**, at Chicago has resigned to become vice president of the **Tuco Products Corpn.**, with headquarters at Chicago. **T. L. Miller**, manager of the western office at Chicago and **H. B. Chamberlain**, assistant to the president, have also been elected vice presidents.

E. W. Davis, representative of the **Westinghouse Air Brake Co.**, at Boston, has been appointed Southwestern manager, with headquarters at St. Louis. **Raymond Boiselle**, representative in the Pittsburgh district, succeeds Mr. Davis at Boston.

The **Wood Conversion Co.**, manufacturers of Balsam-Wool car insulations, have moved their railroad sales offices to larger quarters at 360 North Michigan Ave., Chicago.

Henry L. Sanders, former vice-president of the **Cincinnati Car Co.** was elected president of the company May 17; **A. L. Kasemeier** was re-elected vice president in charge of sales; **J. Howard Elliott** was elected vice president in charge of production and purchases; **E. C. Bernhold** was elected treasurer and will continue as secretary. **Thomas Elliott** will serve the company as consulting engineer. Other officials are **Charles J. Ellis**, chief engineer and assistant to the vice president in charge of production; **Dave M. Ritchie**, sales engineer and assistant to the vice president in charge of sales; **S. E. Reith**, assistant secretary and assistant treasurer.

Harry L. Shepard, formerly with the **Union Pacific**, has been appointed technical representative in the Chicago territory of the **Reading Iron Co.**, Reading, Pa. The New York office of the company has been removed from 99 John street to 30 Church street.

The **National Pneumatic Co., Inc.**, has moved its New York office to the Graybar building, 420 Lexington Ave.

Bruce L. Compton, has been appointed district sales representative of the **Dressel Railway Lamp & Signal Co.**, Arlington, N. J., with headquarters at Philadelphia.

Royal D. Malm, who has had charge of sales in the automotive industries of the **Lincoln Electric Co.**, Cleveland, with headquarters at Detroit, has been promoted to western district sales manager, with headquarters at Chicago, succeeding **R. A. Davidson**, who has resigned to become representative in the Machinery department of **Joseph T. Ryerson & Son**, with headquarters at St. Louis.

S. T. Kiddoo, chairman of the board of directors of the **Stockyards National Bank** and the **Stockyards Trust & Savings Bank**, Chicago, has resigned to become vice president and treasurer of **Fairbanks, Morse & Co. William C. Heath**, manager of the manufacturing division, has been elected vice president in charge of manufacturing.

It has been announced that **Theodore F. Merseles**, president of Montgomery Ward & Co., will assume the presidency of the **Johns-Manville Corpn.** July 1, succeeding **H. E. Manville**, who will become chairman of the board.

The **Crosby Steam Gauge & Valve Co.** has moved its Chicago offices to 547 West Randolph street.

The **Electric Controller & Manufacturing Co.**, Cleveland, Ohio, has appointed the **Petroleum Electric Co.**, 217 East Archer street, Tulsa, as representative in Oklahoma and the Panhandle district of Texas. **J. B. McCarthy and W. P. Robinson** have been appointed representatives in Canada. Their offices are at 307 Reford building, Toronto, and 808 Drummond building, Montreal.

F. S. Jones, district sales agent of the **Colorado Fuel & Iron Co.**, with headquarters at Oklahoma City, has been appointed assistant manager of the steel division, with headquarters at Denver.

Rogert T. Kent, until recently superintendent of **Prison Industries**, state of New York, has been appointed general manager of the **Bridgeport Brass Co.**, Bridgeport, Conn.

A. G. Shaver, who has been consulting engineer for the **Regan Safety Devices Co.**, has opened a consulting office at Chicago.

The **National Railway Appliance Co.**, has removed its New York office from 452 Lexington avenue, to the Graybar building, 420 Lexington avenue.

A. Kastello has been appointed district sales representative of the **Detroit Stoker Co.**, Detroit, for its eastern Canada and Montreal territories, with headquarters at 915 New Birks building, Montreal.

The **Adams & Westlake Co.**, Chicago, has awarded a contract for a one- and two-story plant at Elkhart, Ind., to the **Ralph Sollitt & Sons Construction Co.**

The **Prest-O-Lite Co., Inc.**, New York, has sold the storage battery branch of its business to a new company, **Prest-O-Lite Storage Battery Corpn.** The entire capital stock of the purchasing company is owned by the **Automotive Battery Corpn.**, of New York. That part of the Indianapolis plant of the Prest-O-Lite Co., Inc., used for the manufacture of storage batteries has been leased to the new company. The Prest-O-Lite Co., Inc., will continue the manufacture and sale of acetylene gas.

William Du Pont has been elected a director and chairman of the executive committee of the **Miller Train Control Corpn.**

The **Mummert Lumber & Tie Co.**, has moved its general offices to the Pure Oil building, 35 E. Wacker drive, Chicago.

Walter L. Graser, sales engineer of the **Truscon Steel Co.**, with headquarters

at Omaha, has been appointed manager of the office at Tulsa.

The **Westinghouse Electric & Mfg. Co.** announces the appointment of **Walter E. Thau** as director of marine engineering, with headquarters in New York; **G. E. Wearn,** as central station sales manager with headquarters in New York; **J. P. Alexander** as Boston manager in charge of all sales and service in New England, and **Geo. H. Cox** as sales manager at the South Philadelphia Westinghouse works.

T. P. Gaylord, acting vice president of the **Westinghouse Electric & Mfg. Co.,** has been elected president of the **Pittsburgh Chamber of Commerce.**

The **White Company** announces the appointment of new managers for six district and branch offices: **Rolla W. Moore,** district manager at Portland, Ore., succeeding **C. B. Lynn,** resigned; **R. M. Miller,** branch manager at Oakland, Calif.; **Sidney S. Warner,** district manager at Toledo, O.; **William J. Miller,** branch manager at Harrisburg, Pa.; **C. G. Richardson,** branch manager at Montreal; **Chas. J. O'Brien,** branch manager at Winnipeg, and **B. H. Crowder,** sales manager at the Pittsburgh district office.

A. L. Bliss, district sales manager of the southeastern territory of the **Buda Co.,** with headquarters at Jacksonville, Fla., has been transferred to Atlanta, Ga.

The **American Malleable Castings Association,** 2013 Union Trust building, Cleveland, O., has changed its name to the **Malleable Iron Research Institute.**

The **Economy Equipment Corpn.,** the **LaClede-Christy Clay Products Co.,** the **A. J. Green Fire Brick Co.,** and the **Evans & Howard Fire Brick Co.,** have organized the **Economy Arch Co.,** for the manufacture, sale and service of economy locomotive arch and furnace brick. The offices of the company are in the Railway Exchange, St. Louis, and Broad Exchange building, New York. The officers of the company are as follows: **J. C. Chapple,** president; **A. F. Stark,** vice president, and **W. J. Westphalen,** secretary treasurer. The directors are: **J. L. Green, C. H. King, A. P. Green, J. C. Chapple, A. F. Stark, and J. E. Ames.**

H. P. Hess, manager of the Columbus, O., plant of the **Timken Roller Bearing Co.,** has been appointed assistant to the president, with headquarters at Canton. The **Western Electric Co.,** has organized a new manufacturing branch at its Hawthorne works in Chicago to be known as the **Specialty Products Shop. Jay W. Skinkle,** formerly signaling sales manager of the **Graybar Electric Co.,** has been appointed superintendent. The new branch will make microphone, vitaphone parts, audiophones, telegraph and

B. A. CLEMENTS
Pres., American Arch Co.

railroad signaling apparatus, test sets and telephone heating coil elements.

B. A. Clements, heretofore president of **Rome Iron Mills, Inc.,** has been elected president of the **American Arch Co.,** succeeding **H. B. Slaybaugh** who has resigned. **Lee Deutsch** has been elected president of **Rome Iron Mills, Inc.,** succeeding Mr. Clements.

J. deN. Macomb, office engineer of the **Santa Fe,** has resigned to become assistant to the vice president in charge of railway service of the **Inland Steel Co.,** Chicago.

LEE DEUTSCH
Pres., Rome Iron Mills, Inc.

The **Austin Co.,** Cleveland, has opened a branch office in the Dixie Terminal building, Cincinnati, in charge of **H. L. Cornelison,** former manager of the Miami office. The territory covered by the Cincinnati office includes southern Ohio, southern Indiana and Kentucky. The Chicago office of the company has been moved to larger quarters at 510 No. Dearborn St.

The **Dayton Manufacturing Co.,** Dayton, has opened a new office at 25 Church St., New York, in charge of **Joseph Leidenger,** vice president.

The **Anchor Post & Fence Co.,** of New York and Cleveland, has awarded a contract to the **Austin Co.,** Cleveland, for the first unit of a new manufacturing plant in Baltimore. The present plants of the company are at Cleveland, and Garwood, N. J.

The election of three vice presidents and the retirement of two executives of the **General Electric Co.** were announced by Gerard Swope, president, following a meeting of the board of directors in New York, May 25. **C. C. Chesney,** manager of the Pittsfield works, **W. R. Burrows,** associate manager of the incandescent lamp department, and **C. E. Eveleth,** manager of the Schenectady works, were elected vice presidents of the company, taking on responsibilities in the manufacturing department. **F. C. Pratt,** vice president in charge of manufacturing, and **H. F. T. Erben,** assistant vice president of the manufacturing department, have retired.

Chester W. Rice, who has been engaged in development work in the research laboratory of the **General Electric Co.,** has been named assistant to **E. W. Allen,** vice president in charge of engineering.

The **General Electric Co.** has appointed an engineering council including **E. W. Rice, Jr.,** honorary chairman; **E. W. Allen,** chairman; **Elihu Thomson, A. C. Davis, W. R. Whitney, W. L. R. Emmet, C. C. Chesney and C. E. Eveleth.** The purpose of the engineering council is to advise with the vice president in charge of engineering on various problems. The council may invite other engineers to meet with it, and at such times may give them the status of regular members.

W. S. Moody, in general charge of the transformer engineering department of the **General Electric Co.** since its inception, has been appointed a consulting engineer for all transformer departments of the company and for all departments of the Pittsfield works. **F. W. Peek, Jr.,** who has been a consulting engineer in the transformer department and in charge of the high voltage testing laboratory, has been named engineer of the general transformer department. Mr. Moody will continue to have headquarters at Pittsfield and, as chairman of the steel standardizing committee, will have general direction of all development work on magnetic steel for the company.

Transportation Meeting June 16

The Transportation Club of Los Angeles announces special entertainment for June 16, from noon to midnight, for delegates attending the meeting of the Pacific Coast Transportation Advisory Board, which is to be in session in Los Angeles June 16 and 17. The Transportation Club of San Francisco is joining with the Los Angeles organizations, and will send a baseball team as a special contribution. In Los Angeles special efforts are to be made to bring out a large attendance of the Rail and Water Club, Junior Traffic Club affiliated with the Los Angeles Transportation Club, Southern California Passenger Association, Long Beach Traffic Club, and the San Diego Traffic Club and World's Traders. The Women's Traffic Club of Los Angeles, and its guests also are invited to a special luncheon and the baseball game. Luncheon will be served from 12 to 2 o'clock, June 16 at the Biltmore in the palm dining room, and for this period nine entertainers, an orchestra, and a quartet have been engaged. There will be an informal stag dinner with burlesque extravaganza at the Elks Club from 6:30 p.m. to 12 midnight, June 16. The Los Angeles Railway Co. will contribute a six-piece orchestra.

So Rates Must Be Cut

If deciduous fruit rates are reduced in accordance to the petition before the Interstate Commerce Commission, it will save California shippers about $8,000,000 a year, it was said by Carl I. Wheat, attorney for the state railroad commission, just before he left for Washington, a few days ago. He will present the oral argument before the national commission in the case brought by the California Growers and Shippers' Protective League. It asks that the rate from California to eastern points be reduced from $1.73 to $1.44 a 100 pounds. A bulletin says:

"Hearings were held at San Francisco in March when testimony was presented showing that the deciduous fruit industry is one of the largest in California, having a farm value of $105,756,000 in 1925, while that of citrus fruits in the same year was $85,243,000 and of vegetables $52,047,000.

"The growth of deciduous fruit shipments from California has been phenomenal, increasing from 4411 carloads in 1896 to 86,795 carloads in 1925 and 78,803 carloads in 1926. In 1924, 1925 and 1926 California produced 2,040,000 tons of grapes as compared with 106,700 tons in New York.

"Since 1920 the prices received for California deciduous fruits in the East have steadily declined. At present the industry is facing a severe depression, which can be materially alleviated by a reduction in the freight rates."

Circulars sent out by the American Railway Association referring to damage and claim activities are received by all industrial traffic officials. There is good reason to believe that in most cases these circulars are filed away safely instead of being kept out in the shipping rooms where they belong. The men who do the packing, the actual work," are the men who should see these circulars.

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Will be pleased to forward new bulletin upon request.

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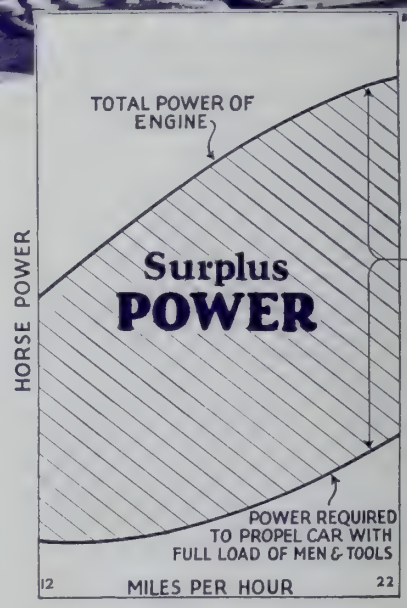

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Emergencies are the test of railway motor cars. Wrecks, wash-outs, or jobs calling for rush handling of heavy materials like rails, switch points, and the handling of men and tools, comprise these "unforeseen" conditions which occur on every railroad and which should be thoroughly considered in the purchase of railway motor cars. Large reserve drawbar horse power is invaluable in emergencies.

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CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industries

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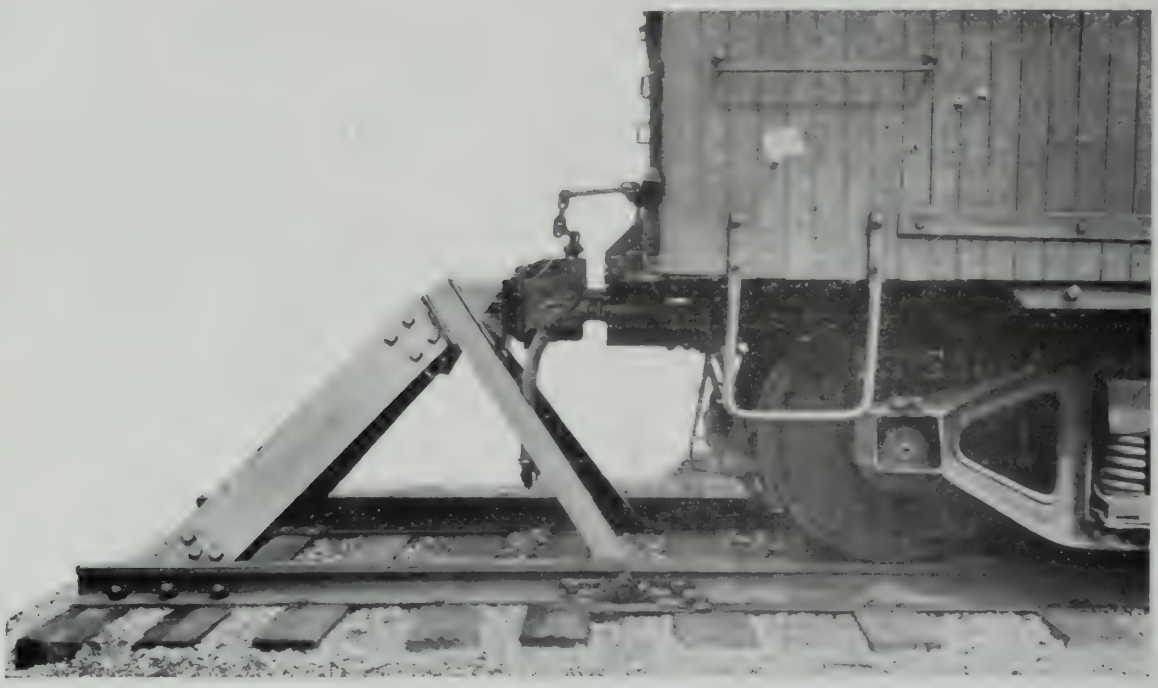
VOL. I JULY, 1927 No. 3

Desirable elasticity



In the days when we went to the little red school house there was a question which was sometimes asked to sound the depth of our knowledge: "What happens when an irresistible force strikes an immovable object?" Now of course the answer to this is that there is no irresistible force and no immovable object.

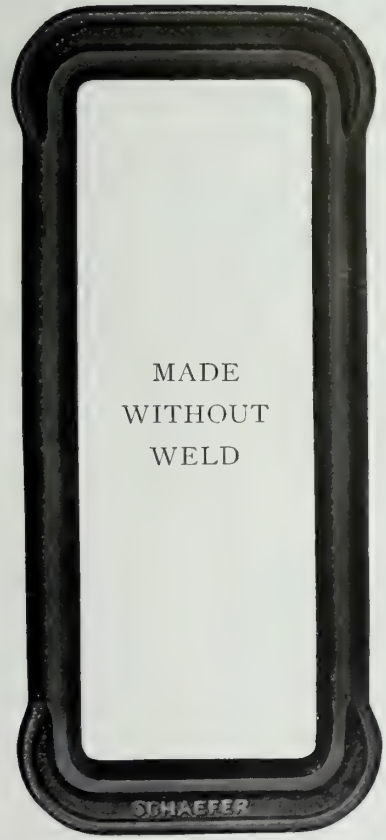
Some of the lurid advertisements of bumping posts which we used to see tried to make us believe that these posts were in reality immovable objects; that no force coming against them could dislodge them. The fallacy of such claims is evident. Even intricate designs of steel beams and rods surrounded by great masses of concrete deteriorate rapidly and while doing so cause much damage to cars.

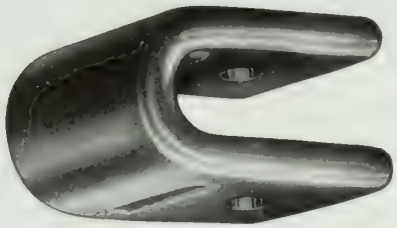
But when you study into the subject do you find that in any but exceptional cases you really want to provide at the end of your track an "immovable object?" The energy of the moving cars has got to be taken to the earth in some manner and isn't it better to use a somewhat elastic post with the resulting decrease in damage both to equipment and to the post?

The Hayes Type W Post is designed to give this desirable elasticity. The result is due not only to the construction of the post but also to the manner in which it is made an integral part of the track structure. Experience in use has amply proved that it stands severe service repeatedly with a minimum of damage either to the cars or to the post.

Hayes Track Appliance Co., Richmond, Indiana

Schaefer Loop Hanger and Clevis Attachment for Brake Beams





The clevis used in this construction is simple in design and of sturdy proportions. It has ample surface in its contact with the side frame and *entirely eliminates side frame wear.*

Safety in performance.
Ease of inspection.
Convenience in application.

Schaefer Loop Hangers are drop-forged *without Welds.*

The section of the cross members is increased 50%, this additional material also provides *Reinforcement at the bends.*

They are *perfectly squared,* a requirement of the utmost importance in brake hanger manufacture. A properly squared hanger insures *even stress* across entire brake head and side frame bracket surfaces which means lengthened life of both hangers and attachments.

Each hanger is *heat treated* and *oil quenched.*

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A2
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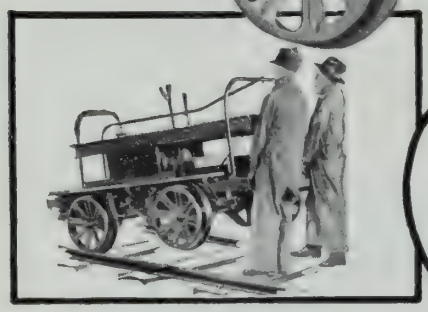

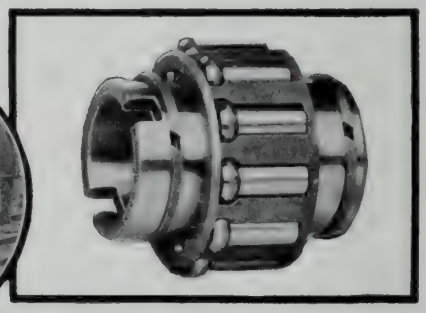

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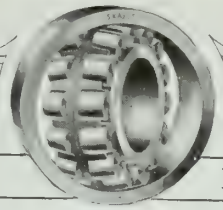

Journal Bearings

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That you can't consider them as a car appliance and expect them to be successful. That was tried twenty-five years ago, but not until SKF applied its broad industrial anti-friction bearing experience to the task was progress made.

SKF started its work twelve years ago. Even today with a six-year record of successful service under standard passenger equipment SKF still regards a new application as an engineering job, to be worked out carefully in the light of past experience.

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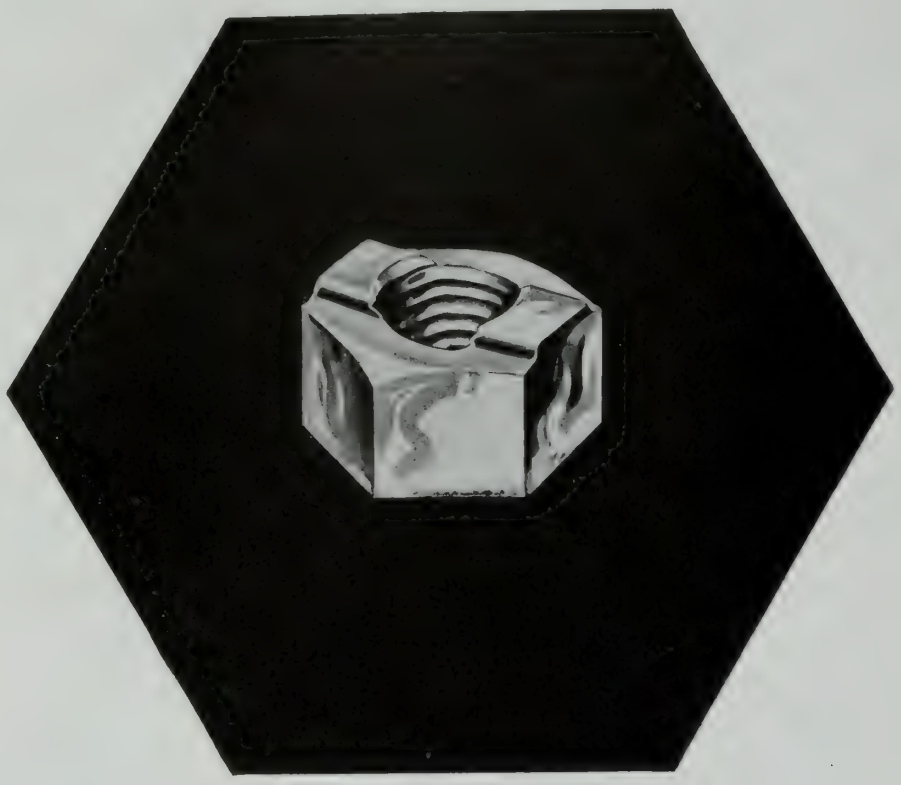

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Transportation

The Monthly Magazine of the Transportation Industries

JULY, 1927

VOLUME ONE NUMBER THREE

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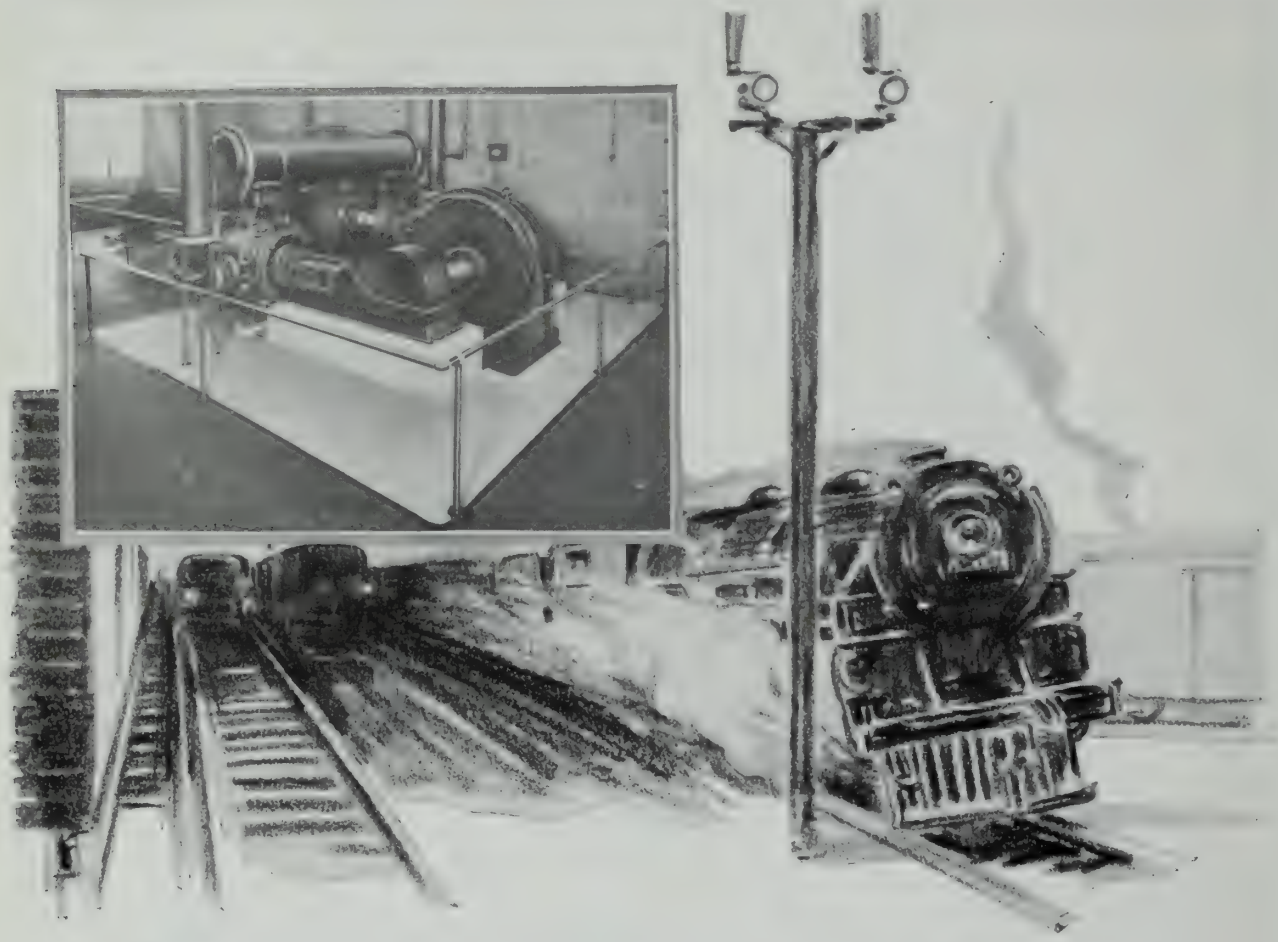

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CHICAGO PNEUMATIC

Depend upon that Name

Superintendents Are Won By Walsh and Memphis for 1928

By
Charles Dillon

J. M. Walsh, New President, and T. B. Wilson, First Vice President, American Railroad Superintendents' Association.

NO SPEECHES will be allowed hereafter in the national conventions of the railroad superintendents. That is to say they will be barred unless the powers forget that the report of Committee No. 1 was adopted the other day at San Francisco. An undeveloped sense of news values led someone to put this unique report last in the advance booklet, but to the old timers, and especially to those who find it difficult to second a motion in less than 30 minutes, it seemed the most outstanding human feature of the whole week and should have had first place. There were a dozen or more committee reports covering the numerous important questions affecting division superintendents — for these officials are not specialists; they need a grasp of every detail of railroading—but no report was more talked about in the lobbies among the gray heads accustomed to annual oratory than was the report of Committee No. 1. This committee made a good impression, too, with its unusual suggestion because it will show the executives at home that these division officers are determined to use their time to good advantage. Many really big subjects are handled by the various committees, and the floor discussion about them is educational and important. Such debate, limited to the question, is certain to be helpful, but speeches by the average untrained speaker rarely amount to much, and often succeed only in sending delegates away to the beaches or the picture shows, or put them asleep.

A. E. O'Dea, Superintendent Transportation, Lehigh Valley R. R., Bethlehem, Pa.

E. H. Harmon, St. Louis, Retiring President, Superintendents' Association.

"The American Association of Railroad Superintendents," said Committee No. 1, "originally the Central Association of Railroad Officers, has been in existence 40 years, and is now composed of over 2000 railway operating officers; it is an important and scientific body of practical railway officers in direct charge of operation of the North American railways.

"We feel the best means of making this association more useful is by eliminating non-essentials, and, with the advantage given by our practical training, address ourselves thoroughly, without favor or fear, to the kernel problems of the railways, so that we may thereby substantially contribute to the science of railroading.

"There is no doubt the general discussions and exchange of

thoughts and ideas result in a great deal of good to members, but it is the opinion of your committee that the entire time of our annual meetings should be devoted to the work of solving problems connected directly with railway operation, and that the practice of scheduling speakers during the business hours of the convention should be eliminated. Reserve all speeches for banquet night, is our suggestion."

It would be a fine idea for other associations to adopt, but with it should go a determination to prepare the discussions, as well as the reports, in advance. "Certain members of experience should be ready ahead of time to discuss subjects assigned them," said one of the oldest members. "The reports are ready quite a while ahead of convention. We might shut off the wind that blows so much in our meetings."

"If we did no more than bring several hundred members together from all over the continent for conference and discussion" said the report, "we should have justified our existence. And no present-day railway officer will deny the educative value of travel on other railways. Few officers will oppose the theory that a man who by earnest effort attains an official position on a railway must of necessity get certain beneficial ideas in traveling over other railway properties. Each will be broadened by a frank discussion with other officers of the trials and tribulations peculiar to his particular territory. Railway superintendents, like all other officials, are apt, when reading of innovations on other railways, to criticize these with prejudice, some perhaps only to themselves, in the belief that the established practices on their own road are quite superior. It is only when we see these innovations in actual practice that we realize their merits and are willing to try them."

C. S. Patton, Supt. Motive Power, Seaboard Air Line, Savannah, Ga.

There must have been nearly a thousand general superintendents, superintendents, trainmasters, chief dispatchers, rules examiners and other divisional officials in the 34th annual convention, and many had their families with them. Every part of the United States was represented, but there also were large delegations from Canada, and Mexico, and unofficial observers from the Argentine and Australia. Mexico sent ten delegates, and they were an extremely popular lot of men, too. Indeed one of the number, J. J. Franco, general superintendent, National Railways of Mexico, was elected fourth vice president of the association, and the by-laws were amended to legalize it.

G. R. Carlton, General Supt., Seaboard Air Line, Savannah, Ga.

The meetings began Tuesday morning, June 21, in the Native Sons' Auditorium in Mason street, and they were all well and faithfully attended. Some of the questions discussed were dry enough, goodness knows, and have been handled this year by all the railroad organizations at one time or another, so that men who have to hear all such talks grow restive, and fidgetty. But this is precisely why superintendents' meetings are so extraordinarily important. Safety sections meet here and there and resolve; the claim prevention division, and the motor transport and the car service and this, that and the other kind of organization get together, and later turn in voluminous reports, the whole accumulation of suggestion and study turning up, eventually, in the yearly pow-wow of the superintendents. And these gentlemen simply have to consume the whole thing digest it, think it over while bobbing around out on the line, and then show up in the convention ready to offer a thought or two worth adding to the sum total.

J. H. Bowen, Trainmaster, Seaboard Air Line, Savannah, Ga.

This year's meeting was enlivened a bit, perhaps, by frequent references to aviation. Next to this subject, safety seemed to be uppermost in the delegates' minds. It certainly was in the afternoon session of June 22 when one of the speakers—the ban not having gone into effect unfortunately for him—declared drunkenness is causing more accidents today than at any time in the past. For a little while it seemed as if every one in the hall wanted to talk to this safety enthusiast, personally, but eventually he made the convention understand that he had referred to highways—not railroads. This was L. H. Collett, safety supervisor for the Santa Fe System. He had led up gradually in his talk to the old-time Rule G., the Santa Fe's prohibition order of long ago—issued before Volstead ever had emitted a sound in congress. It angered everyone, and Collett hastened to explain that he was quoting merely from information gleaned from others throughout the country, and this didn't mollify anyone to any great extent. The crowd was sore, and proceeded to show it.

"The mental condition of men operating trains still is a vital cause of accidents," Collett said in his address. "There is no check on drinking as there was in the

J. H. Hall, Asst. Supt. C. & N. W. Ry., Green Bay, Wis.

days of the saloon. Men imbibe at little private home parties, and more men go on their runs under the influence of liquor than ever before.

"The mechanical departments also are largely responsible for accidents in allowing cars and locomotives to run when in no condition for the road."

Instant objection to these statements by delegates from practically every large railroad in the country brought vociferous applause from the balance of the 250 superintendents at the afternoon session.

"The safety conference at Salt Lake City in 1925," Collett continued, "set a definite goal of 35 per cent reduction in accidents by 1930. Already, with three years yet to go, forty-four roads have made better than a 35 per cent reduction and more than 100 roads have reduced accidents 15 per cent."

Of course Mr. Aishton was there. He had been in Montreal only a few days previously. He had been reported near Washington and a little later at Denver. So no one expected him to show up suddenly on the Pacific Coast. But there he was, speech and all, ready, cheerful, optimistic and encouraging, and the crowd certainly couldn't have shown more pleasure over Lindbergh if he had walked into the hall unannounced. When he could make himself heard, the ubiquitous president of the American Railway Association smiled happily and declared this to be the Lindbergh era of speed and efficiency. "An indication of the railroads' determination to provide the best transportation in history," said Mr. Aishton, "is the fact that 900 million dollars was spent in 1926 for new equipment, additions and betterments."

W. P. Shea, Supt. Chicago Short Line Ry.

C. L. Keohen, Chief Dispatcher, M. & St. L. R. R., His Son, Gerald, and A. T. Brinkley, Trainmaster, Atlantic Coast Line, Portsmouth, Va.

The things that superintendents do and say are not forgotten. From time to time they come up before the railway men's supreme court—the American Railway Association, and very often become the standard practice of the country in operating matters. As may be supposed the superintendents had many serious matters to discuss in their four days' sessions: Aviation; motor transport and its effect upon steam railways and their revenues; signals; train orders; hump yards; car interchange; terminal matters, automatic train control. Practically the entire convention went over to the monthly meeting of the Pacific Railways club at the Palace hotel Tuesday night, June 21, to hear various experts representing different types of this form of device for the safety of life and property.

E. L. McCord, Supt. Mobile & Ohio, East St. Louis.

A good bit of attention was given to railroads' acquiring truck and bus lines. M. F. Steinberger, a special engineer for the Baltimore & Ohio R. R. was urgent. Speaking for a committee of which he was chairman, he said:

"There is a real place for the motor bus and motor truck in the transportation field. A demand for service of that nature is indicated by the growth of long distance lines across country and along the Pacific Coast.

"The inroads on both passenger and freight revenues warrant the railroads' giving serious consideration to the use of motor vehicles to meet competition where there is justification for such service, either from the standpoint of public convenience and necessity, or from the standpoint of economy."

This report came from a special committee whose members had gone into their labors with a thoroughness highly commendable. After a long and extremely technical survey of the business the committee's summary said in effect,

There is a real place for the motor truck and motor bus in the transportation field.

That field

G. H. Moore, Trainmaster, Southern Pacific Co., Sparks, Nev.

J. J. Sullivan, Trainmaster, Southern Pacific Co., Dunsmuir, Cal.

has been generally in the comparatively short haul of passengers, and less-than-carload freight, where expedited and frequent service, frequently from points more accessible than railroad stations is desired.

The growth of the long distance lines and along the western coast indicate, that under special conditions, there is some demand for service of that nature.

Motor competition is here and must be recognized. This competition has seriously affected the revenues of the rail carriers.

These inroads on both passenger and freight revenues of many railroads warrants those roads in giving serious consideration to the use of motor vehicles to meet this competition where there is justification for such motor service, either from the standpoint of public convenience and necessity, or from the standpoint of economy.

A sufficient number of instances have been cited to demonstrate the fact that it is possible and practicable to co-ordinate rail and motor transportation.

J. M. MacArthur, Supt. Canadian Pacific Ry., Medicine Hat, Alta.

There are inequalities in the methods of assessing taxes against motor vehicles as compared with the railroads.

That there is a lack of uniform regulations as to rates, schedules, etc., of motor vehicles as compared with the railroads.

That justice and fairness demand that motor transportation be regulated on the same basis as the railroads, both as to regulation and taxation.

That railroads have no quarrel with the bus or truck as honest competitors, subject to the same laws, economic and otherwise, as themselves. They welcome legitimate competition as an assurance of even better than the "Good Service" now rendered.

The railroads prefer to consider such operations as auxiliary to

C. B. Pettigrew, Supt. St. L. & S. W., Pine Bluff, Ark., and H. O. Wood, Trainmaster, Lehigh Valley R. R., Cortlandt, N. Y.

their own, and make use themselves of the motor vehicle as adjuncts to their own operations.

The committee report declared the last year had recorded increased use of buses and trucks by railroads. It continued quoting freely from a report on the same subject, last March, by a committee of the A. R. E. A.:

"The smaller and less responsible operators are gradually being eliminated through stress of uneconomic operation, or being absorbed by the larger companies. This affects the railroads in two ways, one: where the bus operation is discontinued the competitive feature is removed, and two: where consolidation occurs, the competition is intensified. The problem in its essentials is, therefore, the same, less in certain phases and, intensified in others, and as a result the activities of the carriers should be directed to the achievement of the following ends:

N. E. McKinnon, Trainmaster, L. A. & S. L., Milford, Utah.

"The taking of any legitimate steps to eliminate the operation of the uneconomic competitive operation.

"The effort to make an auxiliary of those operations which are justified by economic considerations.

"We have made no attempt to detail the uses made of motor trucks by individual roads, but are giving only a general summary showing the various applications of the motor trucks to railroad operations.

"For the transfer of less-than-carload freight between main and sub-stations in same terminal.

"For the transfer of less-than-carload freight between the stations of various roads in same terminal.

"For the transfer of freight from in-land (or off line) stations in a terminal to the rail stations.

"In effectuating store-door delivery.

"In effectuating store-door deliveries through constructive stations.

"In the replacement of package locals, for handling less-than-carload freight between stations

C. S. Falconer, Supt. Chesapeake & Ohio, Hinton, W. Va.

on any part of a railroad division.

"In lieu of lighterage at New York and other ports.

"In the transfer of freight from shipper's doors to railroad cars where the use of containers is involved.

"For the transfer of freight between divisions (across country) to eliminate movement through congested terminals.

"For the handling of company material between shops and other company buildings and departments.

"The prevailing reasons which can be assigned for the adoption of the motor truck in the above operations are: Economy in operation: expedited movement.

"These tabulations are presented not for the purpose of showing that the motor truck can be generally adopted and result in expedited movements or lowered costs, but to indicate that there is a field for their use by the railroads, and that special investigations do develop places where the motor truck can be successfully used by the railroads as auxiliary to their rail service. There is no general rule for their application; each situation must be analyzed carefully and decided on its own merits. In general, various applications have indicated that the justifiable use of motor trucks by the railroads is in terminal operations and on hauls up to about 50 miles where train operation economies can be secured by the substitution of trucks.

"It may not be amiss to say a word as to the manner in which the railroads are operating their motor trucks. These methods are: By the railroads themselves through motor divisions; through subsidiary companies; through the medium of contracts with independent companies, the latter scheme seems to be the one most generally used. As to the costs of such operations it was not possible to secure any figures which could be used as a basic or representative of average conditions.

"It is not the opinion of the committee that the railroads should install motor truck lines as competitors of truck lines operated by independents unless their studies develop that a real public need will be met by such installation, or that there is definite economic justification for them.

"The motor coach is admirably adapted to short-haul transportation in limited quantities. In cities double-deck buses carrying as many passengers as a street car are fast replacing this method of rapid transit. In the country and in suburban districts single-deck buses carrying from 20 to 30 passengers are replacing small branch line trains and interurban cars. All of this may be termed 'retail' transportation. 'Wholesale' or trainload transportation provided by subways and elevated railroads in the cities, by commuters' trains in the suburbs and by long-distance express trains cannot economically be replaced by highway transportation. Motor coaches making long runs between distant cities where there is sufficient business to justify maintenance of a railroad and the operation of passenger trains are not generally within their proper sphere and should not be allowed to divide with the rail carrier revenue that is required to produce a fair return on the existing investment. Under proper regulation such uneconomic use of motor transportation will not be permitted."

The superintendents appear to be studying the motor transport question, and doing it pretty carefully. As, for instance, these paragraphs:

"Our investigations indicate there is no uniformity in rates charged by various motor truck and motor bus lines. Many are giving service at rates so low as to seriously jeopardize not only the railroads but the well organized and operated truck and bus lines.

"There can be no question that regulatory bodies should have jurisdiction over these rates, and see that they are maintained at a fair basis commensurate with the service given. If that were done many of the irresponsible operations would necessarily pass out of the picture because of inability to compete with railroads, as their charges would be higher. While it is true that many also fall by the wayside because they cannot exist at the low rates charged, there are others who take their places. If they understood they would be required to set and maintain definite rates they would not enter the business except where there is economic justification.

"The same comments apply to schedules, financial responsibility, liability for loss, damage, etc., i. e.: proper regulatory bodies should be vested with power to insist that the same requirements with respect to these items, as apply to the railroads should apply to the truck and bus lines.

"The railroads require that their men be physically and mentally fit and have had long and thorough training before being placed in charge of trains.

"Equal insistence, then, should be required of the automotive operators that their men be as carefully chosen. The lives and property of the public are in their hands and should be carefully safeguarded, especially as they are not surrounded by all the mechanical safeguards existent on railroad right-of-way and rolling stock.

"Careful regulations should exist as to various types of equipment which should be operated. Sizes, weights, speeds and various safety devices, brakes, lights, etc., should be carefully specified.

"Many of the states have taken steps in that direction, but because of the variance in these items in the states, your committee is not detailing this information."

Hours were given to the question of converting flat yards into hump yards, and copies of the committee's recommendations have been distributed to the mem-

bership. This is true also of reports covering the transfer of cars at interchange points; the advisability of establishing flat per car rates in large terminals for transferring and adjusting loads; the amount of money paid out in claims for loss and damage to freight, etc., and other equally important subjects.

Operating Committee No. 4, after studying the question of signalling on single track without operators or train orders, made this terse recommendation:

"Your committee is thoroughly in accord with the practice of obtaining full utilization of all tracks, and feels that it should reaffirm its former recommendation, namely—

"It is the recommendation of this committee that where the movements are fully protected by proper signalling devices, that full utilization of track systems should be taken advantage of, and that in the absence of such devices such operations should be conducted by the use of train orders.

"Your committee recommends: That where traffic density warrants the expense of installing suitable signal system, trains should be operated by signal indication without train orders."

Long before the convention had worked half way through its program a person not familiar with railroads might be excused for wondering whether any one except the superintendents ever did anything at all. Every hour produced some additional responsibility to be examined, scrutinized carefully, shaken well and taken regularly. Safety first, as one of the big items on the bill, is enough to turn a superintendent's hair white if it isn't already that far gone. "The duties of a superintendent nowdays," said a report on the subject, written by Victor Parvin, superintendent Ann Arbor R. R. and presented to the National Safety Council in Detroit, last fall, "are entirely different from what they were 20 or 25 years ago. At that time, as I recall it, the principal function of the superintendent was to see that his passenger trains ran as nearly on time as possible, or at least that today's train arrived before midnight tomorrow, and that when an engine left the yard that it carried as many cars as possible between the locomotive and caboose, which method of handling tonnage kept the superintendent pretty well occupied in keeping a hole through terminals, which were as a rule congested. About the only other real difficulty encountered was the open saloon, and right here I want to pay my compliments to some of the persons who are trying to tell the world at large that we are worse off under the Eighteenth Amendment than we were before.

"A superintendent's duties of today are entirely changed. This probably can be best illustrated by giving you an insight to a general staff meeting, which might be held on any railroad, and no doubt many of you superintendents of safety and safety agents have attended such a staff meeting. I believe the procedure is about as follows:

"The freight traffic manager has entered a complaint account of symbol or time freight trains running late; next, comes the passenger traffic manager with his story about certain important passenger trains not making the time; the general superintendent has considerable to say regarding the matter of transportation ratio and failure to handle as much tonnage per train as he thinks there should be handled; we next have the superintendent of freight claim prevention telling about the great amount of damage due to rough handling; the chief special agent speaks of superintendents being rather lenient at a time when men get caught with their fingers too far into the door of a box car; the chief engineer informs the superintendent that they have not been watching their maintenance expense as closely as they should; and then the superintendent of safety proceeds to tell the superintendents that their divisions should be more safely operated; then after the discussion of a few more subjects of such detail the meeting comes to a close.

"You might suppose that after spending a day at such a meeting the superintendent would be about ready to throw up his hands and say 'What's the use,' but if he was a man of this caliber he would not last long as a superintendent. The average superintendent can leave such a meeting, go out and get as many laughs out of a show as anyone else, play as good a game of poker (and I have actually known some of them to shoot craps), but when the superintendent returns home he begins to feel around and find out where the rain drops are coming through, or in other words he begins looking for the leaks and he takes up each matter in the order of its importance and endeavors to bring about a correction or improvement in each and every phase of his operation, including his safety first record.

"I have heard it said that a division is only as safe as the superintendent wants it to be. I believe this statement should be changed, and we should now say that a division is only as safe as the superintendent of safety helps the division superintendent to make it. In the first place, it is the superintendents of safety and safety agents who have made the division superintendents safety men, although there may have been many cases where it was necessary for the superintendent of safety, or safety agent, to make the division superintendent a safety man via or through the general manager, but, regardless of methods, the average division superintendent today is a safety man."

There was much more of it, but this is enough to show just how much of a man it really takes to handle this job of superintendent. Mr. Parvin evidently knows the secret. After his report was fin-

ished an outsider said to an old superintendent, "How is it that one finds so few division superintendents in the presidencies?" The old man smiled, a bit wanly, as he replied: "They die before they can get that high. Only the strongest survive."

An interesting and important report was that of Operating Committee No. 5 on the proper place for rail motor cars. The committee said:

"We do not consider the proper place for the motor car is in main line service, except on such lines as are doing a light passenger business and heavy freight business. In the central west of the United States there are many railroads running light passenger trains which could be relieved and substituted with the motor rail cars. The particular railroads in mind are known as reasonably heavy freight lines, such lines operating local way freight trains, time freight trains and heavy tonnage drag trains. The motor rail car on such lines would materially reduce the expense of handing passenger, mail and express business, and the freight business would continue to be handled as at present. However, the room on these cars is limited and in main line service the traffic is sufficiently heavy, in most cases, to justify the operation of some form of transportation which will provide greater seating capacity than that afforded by the motor car.

"We consider the place for the motor car is in branch line service where the steam trains are operated, if not at a loss, then at a very small margin of profit, and a motor car which can be operated more cheaply, requiring two or not more than three men, with much less expense for fuel and wages, can take care of the business on many of the branch lines, in many cases turning an operating deficit into a profit.

"It has been suggested by some members of the committee that more frequent service of this type of car on branch lines might result in additional business accruing to the railway and thus reduce the bus competition which now exists in many sections of the country to a very great extent along those lines. We have not undertaken to say as to this as that is a question that would have to be dealt with by each individual railway, taking into consideration the possible business that might be picked up, the expense of operation, and the interference with other more remunerative traffic.

"We do, however, commend to the railway companies the question of going into this subject fully with a view to seeing if more frequent operation of these cars on branch line service would not result in additional business being handled."

The committee to which was assigned the fine job of saying how to handle more business without buying more cars turned in a good report on a difficult subject.

"There are two ways of handling an increased business without additional cars," said this document. "Increased tons per car and increased miles per car day. Either one or both will bring about the desired result. Twenty-five per cent of the cars in the country are carrying merchandise and 38 per cent are carrying miscellaneout freight. Therefore we have 63 per cent of our cars carrying about 50 per cent of their rated capacity.

"To increase the average tons per car will require the closest cooperation between the shippers and the carriers, except that the merchandise car tonnage rests almost entirely in the hands of the carriers, and this feature alone provides a fertile field of endeavor.

"Shippers of miscellaneous freight should be urged to order no more cars than they can reasonably expect to load within the 24-hour period. In placing orders for cars, they should be explicit in stipulating kind and capacity of car desired, and the character and destination of the load to be placed therein; and a reasonable time should be allowed the carrier in which to apply a suitable car. Obviously 100,000 lbs. capacity cars should not be applied to carry a 60,000-pound load, nor should a car of maximum length be supplied where a shorter one will serve the purpose.

"There is a marked lack of cooperation between the mechanical and operating departments in the handling of bad order cars. To a car inspector a bad order car is just a bad order car, and he is not concerned with any other phases of railroad operation. This results in many cars being sent to repair tracks and delayed 24 hours or more when just a few minutes work on his part would permit the car to run through to destination. Many railroads find it desirable and economical to keep a light repairman in classification yards to make minor repairs and keep cars moving. It is to be deplored that during dull times when reduction in force is necessary, these light repairmen are among the first to be cut off.

"Some method should be devised so that railroads may secure greater efficiency from locomotives. Statistics indicate that locomotives are in service only 50 per cent of the time and therefore we are utilizing only 50 per cent of the enormous expenditure for this class of equipment, while depreciation, interest and carrying charges go on at the rate of 100 per cent. There should be the closest cooperation among mechanical departments, yardmasters and chief dispatchers to the end that locomotives may be kept working. When a train is ready for movement there should be an engine ready to move it, and when an engine is ready there should be a train ready for it to pull, and the chief dispatcher, working in harmony with the yardmaster and mechanical department, should be ready to move trains at the appointed time. Longer runs for locomotives and the proper make-up of trains are each

big problems in themselves and a prolific source of increased car supply. It is of vital importance that more tonnage be carried per car and that cars make greater mileage to the end that the total tonnage may be moved in the least possible time and with the least number of units."

While the business sessions were under full pressure the families of the visitors were cared for by special committees appointed by various city organizations. There were luncheons and teas and rides by motor and rides by boat all over the surrounding sea and country. Finally came the big banquet, Thursday evening, June 24, at the Clift hotel, the official headquarters. With the city officials and other important guests, including a number of railroad presidents of big and little, long and short lines, land and water, more than 1000 guests, perhaps, were present. There wasn't a great deal of speaking, which pleased everyone apparently, except those who had gone prepared to unload something, but what there was turned out was of a high order. Mr. Shannon, acting mayor of San Francisco, welcomed the superintendents for the second time and perpetrated the old one again about there being no key to the city to present them—it was always open. Then the distinguished guests, responding to their names, rose stiffly, blushed and bowed and sat down again. By this time the waiters' clattering of departing dishes had ceased, and the chief speaker was disclosed, Colonel J. F. Byington. Everyone applauded. Colonel Byington knew his history inside out. Starting with Columbus at Palos and ending with Lindbergh at San Diego, he told the colorful, romantic story of California and San Francisco.

It was a great convention, immensely valuable, educational, very informative. Memphis will have it next year. Good-natured rivalry against Memphis was displayed by delegations from St. Louis, Detroit, El Paso, and Jacksonville, Fla.

J. J. Franco, Genl. Supt. National Rys. of Mexico, Mexico City; M. Monoz, Genl. Supt. Interoceanic Ry. of Mexico, Mexico City; C. I. Luque, Supt. Mexican Railway, Orizaba, Mex.; P. Lopez, Train Master, Nat. Rys. of Mexico, Mexico City; J. S. de Echagaray, Supt. N. Rys. of Mex., Mexico City; J. I. Garcia Supt. N. R. of M., San Luis Potosi, Mexico; A. E. Plancarte, Supt. N. R. M., Cardenas, Mexico; A. E. Vera, Supt. N. R. of M., Mondova, Mexico; R. M. Campos, Asst. to Traffic Manager, Mexico City; A. Galvan, Supt. N. R. of M., Monterrey, Mexico.

John M. Walsh, general superintendent of the Illinois Central Ry. Co. at Memphis, was elected president by a unanimous vote. Other officers elected were:

First vice-president—T. B. Wilson, vice-president and general manager of the Southern Pacific Motor Transport Co., San Francisco.

Second vice-president—J. K. Savage, general superintendent Canadian Pacific Ry., Montreal.

Third vice-president—F. M. Brown, superintendent Pittsburgh & Lake Erie Ry., Pittsburgh, Pa.

The by-laws unanimously were amended to provide for the office and election of a fourth vice-president. Chosen for that office was J. N. Franco, general superintendent National Railways of Mexico, Mexico City.

Julius Rothschild, St. Louis, general secretary-treasurer of the association, was re-elected. At the same time Rothschild's salary was increased from $150 to $200 a month.

Walsh, the new president, was in France during the war, and for two years was in charge of French railroads in the Verdun sector. Five systems were under his control when the armistice was signed. Walsh was cited by General Pershing for meritorious service, and a like reward was given him by the French government in bestowing on Walsh a military decoration in the Knights of the Black Star, affiliiated with the Legion of Honor.

The superintendents went by special trains to Los Angeles Sunday, June 26, to be the guests of the city and the railroads before returning to their homes.

Not the violent conflict between parts of the truth, but the quiet suppression of half of it, is the formidable evil; there is always hope when people are forced to listen to both sides; it is when they attend only to one that errors harden into prejudices, and truth itself ceases to have the effect of truth, by being exaggerated into falsehood. . . Truth has no chance but in proportion as every side of it, every opinion which embodies any fraction of the truth, not only finds advocates but is so advocated as to be listened to.—John Stuart Mill.

Two Fine Western Ticket Offices

Santa Fe and Union Pacific

By W. J. Ferguson

IN ONE particular at least, thank goodness, the railroads can provide comfort for the public without political interference—in palatial city ticket offices. And they are doing it. There are no finer examples of this kind of business offices in America than those of the Union Pacific and the Santa Fe Lines in Los Angeles. It is a genuine surprise and pleasure, especially for travelers from the East, to visit these offices, opened recently by these two lines. No eastern city has anything approaching them in conservative excellence, convenience and artistic, business-like decoration, which at the same time, conveys a fine story of the past.

The Santa Fe's new city offices are at 743 South Hill street. The interior decoration is carried out in the Spanish renaissance design. A triumph of architect's and artist's skill has been achieved in creating an effect of elegance and refinement, with the beauty of this classic decorative style, with slight modifications necessary to adapt it to present day commercial purposes. No detail has been overlooked to provide the most modern appurtenances to facilitate ticket transaction with the greatest amount of efficiency and satisfaction.

The interior presents a striking appearance, with highly polished surfaces of black walnut contrasting vividly with the gleaming luster of vari-tinted marble from the famous quarries of Travanello and Rosato in Italy in warm golden tones to encase the wall elevations.

A Familiar Painting of the Grand Canyon

The slabs are laid in checker board design intersected with genuine Spanish tile of brilliant pattern in such fashion as to provide a sparkling note of color. Native Tennessee marble, selected for its richness, hardness and wear-resisting qualities, covers the floor, following the inlaid effect in colors to harmonize with the walls.

Specially selected wood from Indiana's famous walnut forests provides the fine material of which the immense horse-shoe ticket counter is constructed. Twenty selling stations have been provided, including information and validaring sections. High-speed intra-office communicating system has been installed, with tube service direct from selling window to cashier's cage and ticket maker's section. A Pullman diagram room is situated on the mezzanine floor, to which ticket sellers have immediate access with direct telephone lines from counter stations. There is ample room on this floor likewise for ticket accountants. The division passenger agent is at the rear of the office adjoining which the city passenger agents are installed.

The women's reception room occupies a prominent position at the north side of the main entrance, corresponding with a similar space on the opposite side of the room from which the city ticket agent directs the activities of the office.

The furnishings of both the women's reception room and the city ticket agent's office are reproductions of famous Spanish museum pieces, and harmonize with the general decorative treatment. The ceiling is a masterpiece, after the style created by the famous builders of the Fifteenth Century, whose art has never been equalled, and constitutes a striking departure from the usual ticket office design. Color has been given full sway and in contrast to the neutral tones of the marble wall, here primary red with its variations of golds, maroons and crimsons intermingles in emblazoned heraldic designs.

Ten massive hand-wrought chandeliers in pierced brass provide the illumination, as well as contributing an outstanding feature of decorative interest. Ten of America's leading artists were commissioned to paint original canvases hung in strategic positions in the new office. Only representative painters capable of producing the finest of American contemparary art were commissioned to put on canvas the gorgeousness of the West, in sparkling interpretations of such scenes as Grand Canyon National Park, San Francisco Peaks, and romantic and historical

No Ticket Cases in Sight in This Santa Fe Office on South Hill Street, Los Angeles; Convenience, Artistic Elegance, Good Taste.

aspects of Indian life, and mighty marvels of scenic grandeur that lie adjacent to the Santa Fe Trail.

The Grand Canyon is shown on a huge canvas by Hansen Puthuff, California's famous painter. Puthuff painted from a point on the south wall several hundred feet below the rim, and his canvas represents a magnificent study of the titanic gorge, sweeping from the well known Battleship Peak to the Painted Desert in the Northwest, the composition climaxing on the huge bulk of Zoroaster silhouetted against the sky, to which all the other battlements and peaks are subordinated in size and color.

Carl Oscar Borg's picture, "The Ninam Kachinas," depicts a dramatic moment in this colorful event of the Hopi people. The group of figures on the mesa top, painted in strokes bold and sure, such as characterize all of Borg's work, represents a true bit of Hopiland and vividly interprets that romantic country just off the beaten path. The costumes of the dancers are skillfully portrayed and the ancient ceremonial paraphernalia may be accurately studied in this great work of Borg's.

Broadway End of the Union Pacific Systems Fine Offices Opened Recently in Los Angeles.

Elmer Wachtel, prominent among the painters of the West, has achieved a masterpiece with the San Francisco Mountains as his subject. Under a fading sky, the peaks are shown in the late afternoon light in all their ethereal glory. Painted after the high elevations have felt the first touch of winter, the snowcap on the higher peak is in striking contrast to the verdancy of the heavily timbered slopes and the darkening shadows of the foreground.

A heroic canvas bearing title of "The Sun Worshippers" is easily recognized as the work of E. I. Couse, N. A., the outstanding American painter of Indian life. An eyrie home of the cliff dwellers perched between earth and sky is shown. The entrance in a dark recess is tinged with the first rays of the rising sun, in which a mighty chief pauses in devout supplication to the Great Sun God. Many of Mr. Couse's most famous paintings are widely known through the splendid calendar productions used for several years by the Santa Fe.

Theodore Van Soelen's painting, "In the Days of Grim Romance," reflects the daring and romance of the first trail makers penetrating a new land. Interest is immediately focused on Mr. Soelen's remarkable handling of the two horses in the foreground of the picture, even secondary to which comes the colorful ridge of red rock along which the party is traveling and the mountain storm lashing the distant peaks.

"The Peacemaker," painted in a

Looking Through the Union Pacific Systems New Ticket Offices on South Broadway.

Main Entrance on South Broadway

high key, is a splendid bit of art in decorative style. From the brush of E. L. Blumenschein, of Taos, three stalwart figures stand in relief with a tense and solemn mein. Blumenschein's painting of the Taos Indians commands immediate attention, not only on account of his keen insight into the character of his subject, but likewise for his appreciation of the dramatic qualities of this illustrious race, which he so remarkably transfers to canvas.

Smaller, but no less important pictures than the ones mentioned have also been hung on the walls of the new office, the whole collection being a notable example of contemporary art featuring the life and scenery of the West.

In the ticket offices with which the public has long been familiar a feature has been, and still is in most of them, huge ticket cases occupying most of the space behind the counter. No tickets are in sight in these new offices, the necessary cases being "built in," to use a household term, out of the way and more than ever convenient for the men who have to figure them out by the yard.

The new passenger headquarters of the Union Pacific System is at 732 South Broadway. There are over 100,000 pedestrians traversing this block every day, and the new office is but a half block from Seventh and Broadway, one of the world's busiest street intersections.

The architectural motif followed is a weaving together of two periods of Spanish architecture and decorations. The walls are treated in the earlier and more primitive style of rough plaster over stone, as is characteristic of the very early Spanish buildings previous to the plasteresque and rococo periods. Strength is added to the wall surfaces by Caen stone pilasters which rise to the ceiling and carry the major structural beams of the ceiling scheme. Rope mouldings decorate the recessed edges of these pilasters and the surfaces are treated in hand-tooled stone.

A Santa Fe Corner for Women Patrons

The ceiling decorations are definitely from the renaissance period of Spain, with elaborate and intricate designs worked out in warm tones of sienna, blue and buff, high-lighted with bronze and silver over-tint.

Repeating the bays established by the pilasters on the walls are huge hand-adzed ceiling beams of dark walnut, aged and antique, and suggestive of the richness and glory of the dons of ancient Spain.

Supporting the secondary beams of the ceiling plan and suggestive of one of the Union Pacific's important tourist points, are Rocky Mountain sheep heads with their curiously twisted horns. The frieze along the ceiling and walls is emblazoned with buffalo heads, alternating on every other panel, and suggestive of the Overland Trail across which the Union Pacific engineers pioneered their way.

On the side walls are hung massive oil paintings, six feet by eight feet, of nine of the principal tourist attractions along the Union Pacific, which add a luxurious atmosphere to the beautiful office. All the interior fitments and finish are in black American walnut and the floor is rubber marble in tones harmonizing with the general decorative scheme.

The front of the building is developed with an entrance of stone in the Spanish renaissance manner, surrounded in general with rich black and gold marble.

The general decorative scheme in the public space follows the Spanish manner in the furniture and drapes.

He that does good for good's sake, seeks neither praise nor reward, but he is sure of both in the end.—Wm. Penn.

Motto for motorists: Pedestrians should be seen and not hurt. —Life.

Stairway in Union Pacific Office to Women's Reception Room

Fine Work by the Special Agents

Protective Section A. R. A.

By Harper Wells

T. E. Pratt, C. B & Q., Chicago, New Chairman, Protective Section, A. R. A., and J. D. Roosa, Chief of New York Central R. R. Police, Second Vice Chairman.

IN TIMES referred to now as the early days of the service there were no special agents or chiefs or secret service men in the employ of railroads. Watchmen, they were called, and sometimes a few other names unnecessary to mention here.

The protective section, functioning as it does today was unknown. And a sorry time these watchmen had of it. What was called local supervision ruined whatever chance existed for a really intelligent man to protect his employers' property. The special police who succeeded the old fashioned watchman found his chief duty was to act as a spotter for local officials, to watch for tramps who were stealing rides across the country or breaking into merchandise cars. Hatred and suspicion sprang up among employes against these officers and, as Holland says in his interesting story "The Passing of the Cinder Dick," appearing elsewhere in this issue, the officer had to be a tough guy to hold his job. Such a thing as doing work for the claim department was unknown. Officers were afraid to make truthful reports to general officers if they were likely to involve certain classes of railroad employes and their friends. It was nasty, disagreeable, and very often dangerous duty, so nasty that finally no self respecting man would engage in it.

"But now," said T. T. Keliher, chief special agent for the Illinois Central, Chicago, speaking before the Protective Section, American Railway Association, in its convention at the St. Frances hotel, San Francisco, June 21, "nowdays all this has changed. Twenty-five years have recorded a transformation. Graft has disappeared. Railroads have regained public approval. Loss and waste and theft have been steadily and enormously reduced. We see harmonious cooperation among departments. The railroad police, now called for the most part, special agents, are morally free and immune from intimidation."

To be successful a special agent needs many of the qualifications of the upright judge in a court of law, Mr. Keliher said. He should know nothing about personalities. He should be no respecter of persons. He must do his duty as he sees it without fear or favor.

For one thing, speaking of the changes of a quarter century, it is a rare thing now to hear of an employe stealing. Notwithstanding the numerous and more or less continuous crime waves in and around the great cities the loss on railroads through robbery has gone down steadily. R. H. Aishton, president of the American Railway Association, told the delegates in the convention these losses from theft had fallen from $13,000,000 in 1920 to $1,286,000 in 1926, and this, he thought, was a pretty fine record.

Nowadays a railroad special agent reports himself and those under him to the chief special agent, the chief of the railroad police—according to the form of organization adopted by the road—or to a vice president or, in some cases, to the president himself. Such special forces have assumed a new dignity, and with it an increased value to the company employing them. The employe who tries to put over something crooked might just as well resign first, and there is always the chance

W. E. Riggs, American Railway Express, Chicago, and J. C. Cavlston, New York, Secretary, Protective Section.

in an army of nearly two million persons, that here and there a crook will bob up. He doesn't bob up more than once, and if you care to know why you could find the answer any time in a convention of the Protective Section. In the days of the link and pin and the brakeman's axe handle the special watchman-police was either timid or crooked.

J. C. Gale, Union Pacific, Omaha, Retiring Chairman.

He, with the others of his kind, has disappeared. Now the special agent or the railroad chief of police sits in convention listening thoughtfully and gravely to a discussion of new or suggested laws to deal with criminals. He considers the latest developments in legislation in New York state, or in the changed criminal code of California, described by a learned attorney, making notes as the address proceeds, and putting intelligent questions to the speaker when he has finished. He attends meetings of the freight claim prevention division or listens to reports of its labors, and makes himself generally what he is supposed to be, a keenly intelligent investigational officer of the railroads performing extremely important work.

Henley C. Booth, an attorney for the Southern Pacific Co., spoke of all these things in the San Francisco sessions of the Protective Section. "The old idea of fighting claims has gone out," said he. "Now it is, rather, a contest to see which road pays the least and pays it quickest. This is a time of settlement, not of litigation. Out of 500 claims for personal injuries in a month not more than 2 per cent ever get into court. The Protective Section gives us most valuable assistance in getting the facts, and when you help an attorney to get the facts you help him to cut down his mistakes."

Referring to the new criminal code of California Mr. Booth said the things of special importance to stress upon the criminal mind was the speed and certainty of punishment, and these, he declared, are much more important than drastic punishment. Criminals, he said, fear speed and real law enforcement. Railroad special agents were urged to study all the new laws affecting their work and were told where and how to get them, and precisely how they might help in their own states in effecting desirable changes in certain laws.

"For one familiar with railroading for more than 30 years," said one of the visitors from the superintendents' national convention in session a few blocks away, "this Protective Section is a real surprise. Of course I knew we had some pretty high class special agents on our line, but this whole outfit over here is high grade. Great goodness, man, there isn't a delegate here who looks as if he'd ever been a policeman if you get what I mean."

Describing the work of the section the secretary, J. C. Caviston of New York said freight claim payments have been cut from $109,000,000 to $38,000,000. About 100,000 persons are arrested for theft by railway police each year, the records show.

Cooperation between federal and state officials and railroad agents is responsible for this improvement, H. L. Denton, police superintendent, Baltimore & Ohio, told the convention.

T. T. Kelliher, Illinois Central Police Chief, Chicago.

District Attorney Matthew Brady complimented the officials on their achievements and told of several instances of valuable service rendered state and county officers by intelligent, energetic railroad police.

W. E. Carpenter, claims superintendent, American Railway Express Co., San Francisco, said the loss of express shipments by theft had been reduced by nearly one-half from 1920 to 1926.

In all the sessions the papers and addresses were snappy and interesting. The speakers, for a wonder, stuck to the subjects, and seemed inclined to confine themselves to matters upon which they were informed, and was commendable. W. M. Skenyon, chief of the Hocking Valley Railroad's police, Columbus, O., spoke on "The Special Contribution of Railroads to Public Welfare." F. F. Phillips, chief special agent, Santa Fe System, talked on "Concealed Loss, and the Method of Handling." In the morning session, June 22, G. S. Ward, chief special agent for the Wabash at St. Louis read a paper on "Problems of a Railroad Special Agent and His Success." A thoughtful address was given by T. E. Pratt, chief special agent for the Burlington on Relations Between Railroad Special Agents and Law Enforcing Officers."

The election of officers for the next year resulted: Chairman, T. E. Pratt, C. B. & Q. R. R., Chicago, first vice chairman, T. T. Keliher, Illinois Central, Chicago; second vice chairman, J. D. Roosa, chief of New York Central police, New York.

Committee of direction: L. J. Benson, general superintendent of police, C. M. & St. P.; F. F. Phillips, chief special agents, Santa Fe System; R. S. Mitchell, chief special agent, Missouri Pacific, St. Louis.

Recklessness is no indication of courage. Brave men are always cautious. Therefore, cultivate the habit of being careful.

The Passing of the "Cinder Dick"

Protective Work by Experts

By C. L. Holland

TIME was, and not so many years ago, when a railroad copper had to be a tough guy to hold his job. He was called a "cinder dick," but he isn't called this any more. Indeed, he has disappeared, along with the old-time jerry whose highest conception of machinery was to know how to oil the section car, and keep out of the way of Number Ten.

The cinder dick's place has been taken by the special agent, special officer, detective, patrolman, sergeant, lieutenant, captain, or inspector of railroad police. In the old days the train service, and the yardmen, as well as some of the other employes, had a misconceived notion that the special agent always was trying to get something on them, trying to get their jobs, or get them in bad. Little or no cooperation was given him by the rank and file on many roads, and his path was anything but smooth.

But all this has changed. Practically every railroad of any consequence is rapidly realizing the necessity and value of an organized special service or police department, and is giving assistance to the head of such department in order that the protective arm of the service may be fully established, and function efficiently. One certain road of prominence has procrastinated for several years in organizing a department, being content to operate with a few police officers who report to, and receive instructions from an operating official who has little knowledge of police, detective and investigation work. The results this road is receiving from its special service department are far from satisfactory. There are roads that have long since established police departments, but the management has failed to provide the necessary backing, and this has resulted in lowered efficiency.

When one considers that railroads have in daily transit an average of 300 million dollars worth of high-class merchandise, the responsibility of transporting safely thousands of passengers day and night; with millions of dollars invested in equipment, buildings, fixtures, tools, materials, and other miscellaneous property, one can realize that upon the railroad police rests a stupendous job of affording adequate and continuous protection.

A New York Central Policeman.

According to a statement of the protective section, American Railway Association, the losses in 1926, due to robbery of freight while in transit on the railroads of this country were the smallest for any year since 1920 when the compilation of these figures began.

Robbery losses in 1926 amounted to $1,314,501. This was a decrease of $177,942, or nearly 12 per cent below those for 1925, and a reduction of $11,412,446 below those for 1920, when robbery losses were the greatest for any one year in the history of the railroads. There is no doubt that the activities, and the tireless work of the railroad police departments have been directly responsible for this gratifying showing.

With a higher type of police officer, increased efficiency of the police departments, the railroads as a whole are far better off than they ever have been as regards the suppression of the activities of the freight car thieves and other criminals who prey upon the railroads. Cooperation of employes in all departments is in no small measure instrumental in the success being made. Most of the employes are giving their assistance in keeping down freight claims, as well as preventing and eliminating losses of all kinds.

Cooperating with the police department, the yardmasters, terminal trainmasters, yard conductors and others, can be of valuable assistance in placing cars containing highclass merchandise, including coal during the winter months, as near the center of the yard, as far from the outskirts of the yard as practicable, so as to eliminate the hazards of thefts. Likewise in making up trains, they can help by placing cars of particularly valuable merchandise preferred by thieves next to, or as near the caboose as conditions will permit.

Foremen and others in charge of loading and transfer platforms can contribute their part by seeing that merchandise cars are in good condition, especially the doors and hasps, and as an added precaution, they can and should cleat the doors. One plan found to be very effective is to cleat the door on the side by placing the cleat on the inside of the car; the other cleat on the outside of the other door, this cleat to be placed about center of the height of the door, out of convenient reach of the thief. These cleats serve more than one purpose. Broken hasps,

and doors that slide with the possible loss of lading by falling out will be avoided in this way.

The managements of many roads know the police department can handle much additional work other than the investigation of car thefts and other losses. Assisting and working with the claim departments, both freight and personal injury, as well as clearing up many irregularities is but part of the work of the police.

Much special work formerly performed by detective agencies and investigation bureaus for the railroads, can be, and is now being performed by the police departments of several railroads, and has resulted in saving large sums that would have otherwise been appropriated for this special work.

Handling the minor trespasser has always been more or less of a problem with many roads. The railroad policeman has shown gratifying results in dealing with the young boy who "flips" the freights, and who begins his career of petty pilfering of coal from cars, scrap metal and so forth. Tact and patience are required in this work, but opportune visits to parents of the young offender, as well as to the schools where he attends, and friendly talks by the officer to the pupils, have brought about excellent results.

The heads of the majority of the railroad police departments are men who have had much successful experience in police and investigation lines, and they are demanding more and more every day, that their subordinates be fully experienced, of high intelligence and good character. These men are being taught the importance of courtesy and tact in dealing with the public in general, and the necessity of exercising care in dealing with the criminal, or suspected persons, in order that his actions will not involve his road in litigation.

One of the most vital factors in connection with the average railroad police department, is the noticeable absence of politics in its personnel. This is strongly in contrast with the forces of countless numbers of police forces in city, county, and state. The railroad policeman secures employment, and retains his position on his character, intelligence, experience, and general fitness.

"Healthy" Locomotives Make New Records

Every day, in every way, locomotives are getting better and better, according to George McCormick, general superintendent of motive power for the Southern Pacific.

"To an engineer a locomotive is almost human," McCormick said. "If the steam valves through which 'she' breathes are not set true, the locomotive is 'lame.' When the feed water pump or injector fails to function, 'she' is 'paralyzed.' If the cylinder head blows off the locomotive 'coughs' and when one of the side rods connected with the driving wheels breaks, 'she' is 'crippled.' If the boiler foams 'she' is 'bilious,' and when flues leak sufficiently to extinguish the fire, 'she' is 'dead.'

"Not only is the locomotive of today less prone to those 'ailments' but 'she' is almost 25 per cent more powerful than the average locomotive of 1925. Greater efficiency in keeping equipment in excellent condition has been achieved by the railroads by the expenditure of hundreds of millions of dollars for enlarged and improved shops and for the employment of skilled mechanics.

"For 1920 the average number of locomotives in need of repair was 24.5 per cent. In 1926 this was reduced to under 17 per cent, and now it is down to 14.5 per cent. This means fewer accidents and delays, and indicates a vast increase in the ability of the Class 1 roads to handle the nation's business swiftly and efficiently."

In 1812 Oliver Evans, an Englishman writing on transportation, said: "I do verily believe that the time will come when carriages propelled by steam will be in general use as well for the transportation of passengers or goods, traveling at a rate of 15 miles an hour."

—Wide World Photos

Valuable Property in These Cars Must Be Guarded Night and Day by the Railroad Police Force.

Reasons for Variable Load Brakes

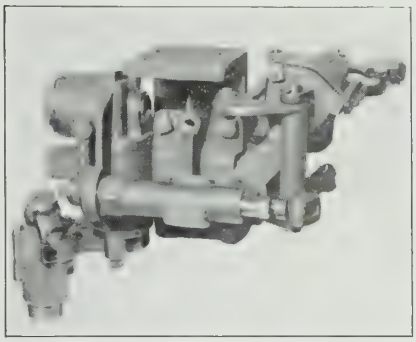
The Value of a Second

By C. D. Stewart

Westinghouse Air Brake Co.

IT HAS been said that because progress is the normal expectancy of society that a radical, in the long run, may be proved right, but a conservative, never. So with the mechanical arts. When purported improvements appear, opinions may reasonably differ as to whether the improvement exists in more than name. But rigid analysis and the test of actual service should disclose whether the "improvement" may rightfully and properly be so called. It is the purpose of this discussion to consider the variable load attachment from these viewpoints, and its advent has made practicable operating conditions which heretofore it has not been possible to produce. Particularly, this attachment is of interest in that its benefits may be secured at an increase in cost of the finished car of but roughly two per cent.

In this discussion, the relative value of seconds must be kept in mind. Where an operation is seldom repeated, a second is of small consequence but where the operation is repeated at close intervals, seconds are matters of serious concern. Brake applications, in congested districts, may be made every two minutes, so that a second saved per stop becomes a matter of economic importance. Perhaps the value of



The Variable Load Valve.

saving seconds can best be illustrated by quoting J. K. Brice, traffic manager of the London County Council Tramways. In an address before the Institute of Transport at London, Mr. Brice said a saving of one second at every stop would represent to his system a total saving every day of 220 hours, which would permit 2,000 additional car miles to be run daily without increase in the number of operators or number of cars. Viewed from a different angle, the same number of car miles could be run every day with 17 fewer cars. A saving of 17 cars at $9,600 a year each would mean a reduction in operation cost of $163,000 a year.

Not only is a second saved per stop of value in that it enables an increase in schedule speed, but the automobile has made short and rapid stops more vitally necessary than ever before. Because of the greater adhesion between rubber tire and pavement as contrasted with steel wheel and rail, the automobile or bus has an inherent capacity to make a shorter stop than a street car. But to keep abreast of the traffic stream, the street car must make stops duplicating those of the automobile or bus as closely as practicable. To approximate such a condition requires that the brakes of the street car be highly efficient, in order to offset, to the maximum extent, this inherent limitation under which they operate. No other device removes this limitation to the same extent as does the variable load attachment and on this account, if no other, it deserves the close scrutiny of every electric railway operator and especially so, since its application is not confined to new equipment.

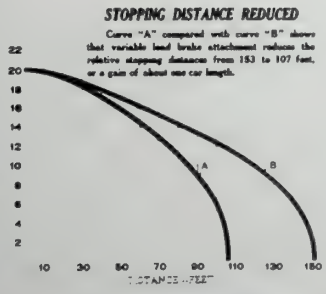
The variable load attachment, consisting of a variable load valve and operating mechanism, is a device by means of which the braking ratio of a car for all full service or emergency applications, may be held substantially constant for all conditions of pas-

— Paper read before the convention of the California Electric Railway Ass'n., Los Angeles, June 20-21. Mr. Stewart is vice-president and district engineer at San Francisco for the Westinghouse Air Brake Co.

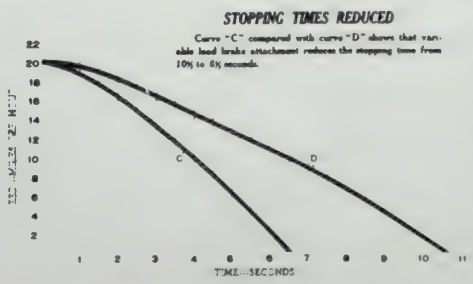
BRAKE EFFICIENCY INCREASED BY VARIABLE LOAD BRAKE ATTACHMENT

COMPARISON OF FULLY LOADED CAR WITH AND WITHOUT VARIABLE LOAD BRAKE ATTACHMENT

(CALCULATED FROM ACTUAL SERVICE TESTS)



INCREASED SAFETY—When the car with the variable load brake attachment had been brought to a stop, the car without it was still running at a speed of 12 miles per hour.



INCREASED EFFICIENCY—The saving in time permits of more frequent service with the present number of cars, or maintaining the present schedule with a less number of cars.

senger loading. Stated in another way, the variable load attachment provides that the brake shoe pressure, bears a constant ratio to the load on the wheel. Without the variable load attachment a certain maximum shoe pressure can be attained irrespective of whether the car is loaded or empty. Obviously the effect of this shoe pressure will become less as the car becomes loaded. But with the variable load attachment a variable maximum shoe pressure is automatically changed with the passenger load. Evidently this provides that the loaded car can be stopped as readily as the empty car.

Its action is based upon the fact that the truck springs deflect in proportion to the load carried by the car body. When the car doors are opened, the operating mechanism measures the truck spring deflection existing up to the time the doors are closed, adjusts the variable load valve correspondingly, and in this position it is locked when the car doors close. At the next and succeeding brake applications until the car doors are again opened, the maximum pressure passing to the brake cylinder is limited, by the variable load valve, to that which will give the full service braking ratio. It will be observed that the maximum cylinder pressure is variable and depends upon the degree of car loading but the maximum braking ratio is held constant within reasonable limits.

The variable load attachment was developed to meet conditions actually existing in service and which were brought to the attention of the air brake manufacturers for relief, by the Boston Elevated Ry. Co., in 1922. It is important to note that the need for such a device was primarily recognized by an operating organization and that the device was developed to meet a need already realized. The problem confronted by the Boston Elevated was one of insufficient retardation for fully loaded cars, a condition brought about by continued efforts to reduce the ratio of car weight to passenger load.

The braking ratio (here used as commonly to mean the ratio of total brake shoe pressure to car weight) then employed on the empty car has been proved by experience all that could be used without meeting the excessive wheel skidding. Skillful motormen could avoid wheel skidding except in emergencies with even an abnormally high braking ratio. But an emergency application, when an emergency valve is used, takes control of the application and prompt release away from the motorman, and if the braking ratio is too great wheel skidding will result. Poor motormen are more likely to skid wheels, the higher maximum braking ratio.

The variable load attachment is therefore based upon the fact that modern practice is to place the value of the braking ratio for the empty car as high as possible, and yet have a reasonable margin against wheel skidding during emergency application, then as the weight of the car increases, the brake shoe pressure can be increased while retaining the same margin against wheel skidding. By utilizing this principle, the variable load attachment was developed to take care of the situation pointed out by the Boston Elevated Ry. Co.

To avoid collisions in emergencies, it is imperative that the stops be the shortest possible. A widespread recognition of the need for short stops is manifest in the desire for brakes which apply and release most promptly.

The brake on the empty car should, therefore, be improved to the maximum extent. It must be made quickly responsive both in application and release; and it must develop a maximum shoe pressure just short to cause wheel skidding under average conditions. With the ordinary brake its efficiency decreases as the car acquires a passenger load because the maximum shoe pressure cannot be increased, and yet the weight which the shoe pressure is retarding is continually increasing as the passenger load becomes greater. The variable load attachment offsets this condition for it provides that the shoe pressure will automatically increase with the passenger load.

Comment frequently arises as to why the same results as secured with the variable load attachment cannot be obtained by merely increasing the braking ratio on the empty car. It has previously been explained that such a plan incurs too great likelihood of wheel skidding during emergency applications with consequent lengthening of the stop distance. Another reason also exists. Operating experience has shown that it is undesirable to have the brake on the loaded car less effective than on the empty car, because such a condition requires greater vigilance on the part of the motorman to avoid accidents. Since the ratio of car weight to passenger load is decreasing and traffic congestion increasing, the decree of vigilance required will continually increase. If the braking ratio is increased and wheel skidding avoided by skillful manipulation, it will still be possible to stop the empty car in a lesser distance than the loaded car. Hence there exists a lack of uniformity as between the stops of empty and loaded cars. With the variable load attachment, no such lack of uniformity exists.

Not only does the variable load attachment permit the most powerful brake which experience dictates to be used on both the empty and loaded car, but it makes the action of the brake uniform and independent of the fluctuation in main reservoir pressure. A governor range of less than ten pounds is seldom encountered in actual service. But with a setting of 50 to 60 pounds, this means that the maximum setting gives a brake 20 per cent more powerful than the minimum setting, considering full service applications. The variable load valve eliminates the influence of main reservoir fluctuations and

produces the same braking ratio for all conditions of car loading. It accomplishes this result because the maximum setting of the variable load valve corresponds to the minimum setting of the governor.

Experience has shown that the maintenance cost of the variable load attachment is remarkably low. In considering maintenance costs, the relative cost of maintaining equipment and of conducting transportation must be kept in mind. Bulletin No. 138 entitled "Electric Railway Operations in 1926," issued by the American Electric Railway Association gives, on the basis of reports from 231 properties, the cost of maintaining equipment as 4.45 cents per car mile; and the cost of conducting transportation as 14.74 cents per car mile. A ten per cent reduction in the cost of conducting transportation, therefore, would balance a 33 per cent increase in the cost of maintaining equipment. Reduction in the costs of claims must also have consideration when reviewing anticipated maintenance costs. It should be clearly recognized, therefore, that in reducing the cost of transportation and of claims, the variable load attachment needs to effect but a small percentage economy to more than offset any increased maintenance charges.

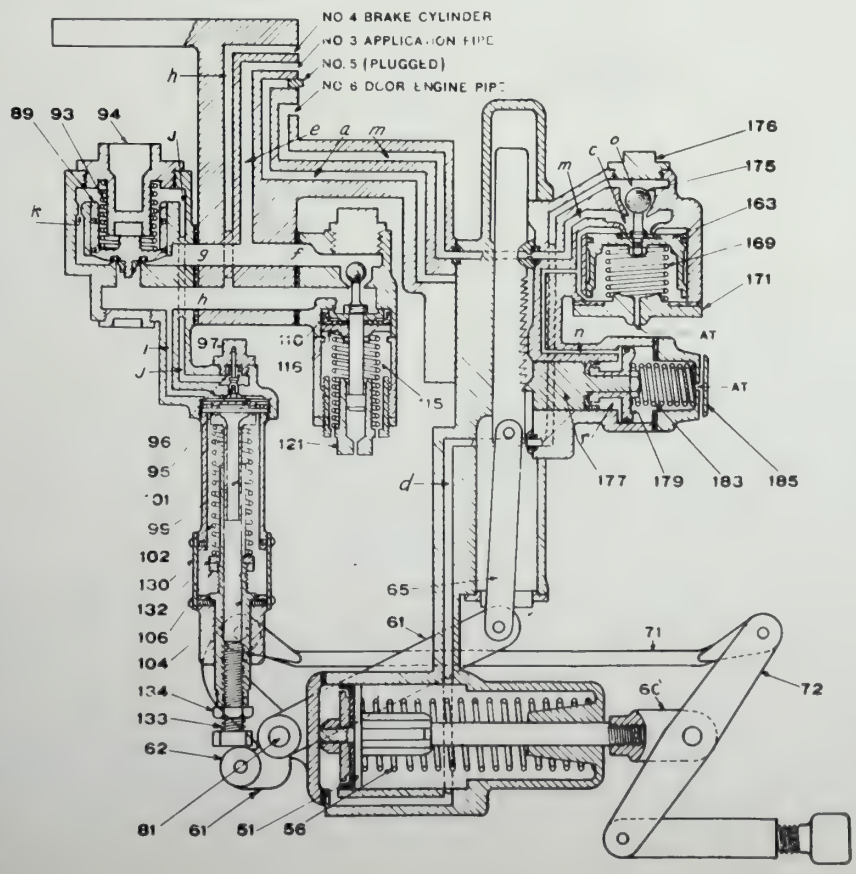
The variable load attachment shows the maximum saving under conditions of heavy car loading and close headway; that is, in rush hour service. But it is rush hour service which is the most expensive rendered by the electric railway. The peak service found in rush hour calls for extra cars, extra crews, increased non-revenue mileage, increased power plant capacity and in many other directions, expenses which not only add to the capital outlay but also largely increase the current expenses. The variable load attachment by facilitating rush hour service reduces costs when they are at the maximum and by so doing yields a very handsome return on the expenditure it causes.

It might be of interest to state that in the five years this equipment has been available 33 roads have placed in service 1561 sets.

As mentioned previously, the variable load attachment consists of a variable load valve, and an operating mechanism. The variable load valve weighs approximately 127 lbs. and the operating mechanism about 23 lbs., making a total of 150 lbs.

Figure 1 is a photographic view of the variable load valve. Figure 2 is a diagrammatic view of this valve. Figure 3 is a graphic chart of the time and distance saved with the use of the variable load attachment over the usual straight air brake. It will be noted that for the conditions considered the variable load brake equipment will bring to a stop the same weight of street car in 46 feet shorter distance, and that when stopped the street car not so equipped is still going 12 M.P.H. Also from a time saving standpoint it will be noted that the variable load brake under similar conditions effects a saving of four seconds.

Referring back to the diagrammatic drawing, it will be noted that the variable load valve is installed between the emergency valve and brake cylinder and through it passes the brake cylinder pipe. The function of the valve is to limit the pressure which may pass to that required to give the full service braking ratio for the passenger load existing. Air from the straight air pipe travels through the emergency valve and enters the variable load valve at No. 3 marked on the drawing Application Pipe. It then proceeds to chambers g and f; and from chamber f past ball check 110 to chamber h whence the air can flow directly to the brake cylinder by means of the brake cylinder pipe, connected in at tap No. 4.



When the pressure in the brake cylinder has increased to, say two pounds less than that required to develop the full service braking ratio on the empty car, the pressure

is sufficient to compress spring 115, forcing the piston 116 downward and permitting ball check valve 110 to close. This downward movement of the check valve prevents further flow of air to the brake cylinder through this passage. The mechanism just described is known as the by-pass valve. Its purpose is to provide a passage into the brake cylinder in the event the limiting valve is improperly assembled, the regulating spring breaks or the limiting valve is inoperative for any reason whatever. It is evident that until the pressure is reached for which the by-pass valve is adjusted, air may pass freely to the brake cylinder since normally open passages are provided by the by-pass valve.

The main passage to the brake cylinder is by supply valve 89. The upper side of the supply valve is connected to the brake cylinder by means of passages j and i and chamber h. Consequently, the pressure on the upper side of supply valve 89 is less than that on the lower side, since chamber g is directly open to the application pipe from the emergency valve. The supply valve moves upward, therefore, connecting chambers g and h, or application pipe and brake cylinder. So long as regulating valve 95 is held from its seat by means of regulating spring 102, the upper side of the supply valve 89 is connected to chamber h or brake cylinder by means of passages j and i. But as pressure is developed in the brake cylinder or chamber h, the diaphragm 101 is deflected outwardly against the resistance of regulating spring 102. Finally sufficient pressure is obtained to move diaphragm 101 outwardly far enough, to permit regulating valve 95 to close, thus closing the exit of passage j. Then pressure passing from chamber g by means of choked passage k to the upper side of supply valve 89 causes the pressures on both sides of the supply valve to equalize, since the exit from passage j is now blanked. When the pressures have almost equalized, spring 93 forces the supply valve to its seat and prevents further flow of air to the brake cylinder.

It is evident that supply valve 89 closes whenever the brake cylinder pressure is sufficient to move diaphragm 101 outwardly against regulating spring 102 to an amount which will permit regulating valve 95 to close. By changing the resistance of the regulating spring, therefore, the supply valve can be made to close at different pressures and thus limit the cylinder pressure obtainable to different values. The resistance of regulating spring 102 is changed by means of the operating mechanism. The action of the operating mechanism is controlled by the variable load valve, however.

When a car door is opened, air is admitted to the variable load valve at tap No. 6, marked on the drawing Door Engine Pipe. It passes through passage m and by ball check valve 175 and by means of passage d reaches the strut cylinder piston 51. The strut cylinder piston consequently moves outward. The pressure which must be developed to move the piston outward finally becomes sufficient to force downward piston 163, which permits air from passage m to reach the lock piston 179 by means of passage n. The lock piston 179 moves outwardly against spring 183, which enables lever 65 to move freely.

The initial movement of the strut piston caused the lever shown at the lower right in the drawing to move until it encountered a stop on the truck. When lever 65 is unlocked, further movement of the strut piston causes lever 71 to move to the right or left, depending upon the distance the lower right lever must travel before it encounters the stop. That is, lever 72 pivots about fulcrum 60 in accordance with the relative position of the stop. Through bell crank 61, this movement is communicated to the regulating spring 102, compressing the spring as the passenger load increases and relieving it as the passenger load decreases.

When the doors are again closed, air is exhausted from passage m. Piston 163 moves upwardly, permitting the air in passage n to escape before the strut piston has commenced its return movement. Consequently lever 65 is again locked while the operating mechanism is in contact with its stop. It should also be mentioned that when lever 65 is first unlocked, the compressed regulating spring 102 tends to expand but it can re-act against the operating mechanism without shock because this operating mechanism is in contact with its stop before lever 65 is unlocked.

The purpose of locking the variable load valve in its adjusted position is so that the valve will have positive and proper adjustment and also because this locking permits the disengagement of the operating mechanism from the truck stop whenever the car doors are closed, thus avoiding the wear of the apparatus which would otherwise result because of relative movement between car body and truck.

The variable load valve is intended to be operated with air taken from the door engine opening pipe. Such an arrangement is of advantage where the door combinations are simple. But when anyone of several doors may be opened at a stop, it is better to apply a magnet valve, which is energized by the opening of any car. This magnet valve admits air from the main reservoir to pipe No. 6.

The supply valve 89 is required when air passes through the variable load valve to the brake cylinder direct in order that the passages may offer no restriction. But when a relay valve is employed and the air passing through the variable load is limited to the small quantity required to operate the relay valve, the supply valve 89 can be omitted and the limiting of the pressure is then contolled directly by the regulative valve 95.

The Pole Framing Yard at a Creosoting Plant.

The Valuable Virtues of Creosote

Low Bids or Quality?

By E. H. Boehne

International Creosoting & Construction Co.

THE use of creosoted pine poles, according to government statistics, increased 500 per cent between 1920 and 1925. Five hundred thousand were installed in 1923. That number increased to a million in 1924. What makes this particularly interesting is that it was the only species of pole that materially increased during that period.

Obviously there is represented here a very definite swing of the industry. When utilities that had not considered creosoted pine poles before, began to study them intensively the creosoting industry found it necessary to put its information on the subject in readily available form.

—A paper presented before the Missouri Association of Public Utilities, Cape Girardeau, Missouri.

A pole's worth is measured by the length of time it gives satisfactory life in the line. Decay shortens that life in the majority of cases. Decay in wood is caused by low forms of plants called fungi, and by bacteria. Through the secretion of little-understood chemicals, they dissolve the wood fiber, and its substance serves as food for the fungus. The science of timber preservation consists in poisoning that food, the wood. Creosote is the poison. The operation of injecting it deeply into the wood by pressure is the work of the modern wood preserving plant.

There are other wood preservatives, but creosote is by far the best known. The highest grade that can be used, and the only grade that should be used is that which complies with the specifications of the American Wood Preservers' Association and the American Railway Engineering Association.

The first step in creosoting pine poles, or rather a step preliminary to their treatment, is to season them to permit the entrance of the creosote. This is accomplished either by allowing the wood to dry in a seasoning yard, or by steaming it in the treating cylinders.

Two processes have recognized standing and are in general use for pole treatment. They are the Bethel process, using 12 pounds of creosote per cubic foot of wood, and leaving the wood cells full of creosote after treatment, and the

Rueping process retaining 8 pounds of creosote per cubic foot, leaving the wood cells partly empty after treatment.

In the Bethel process, after the material is placed in the cylinder, a vacuum of about 24 inches is maintained until the wood is as dry and free from air as practicable. Then, without first breaking the vacuum, the cylinder is completely filled with the creosote oil. After the retort is filled, additional creosote is forced into the cylinder by means of pressure pumps, the pressure being gradually raised to and maintained at not less than 125 pounds per square inch at a temperature of 180 to 200 degrees F., until the required amount of the preservative has been forced into the wood. The pressure is then released, the oil drained from the cylinder and another vacuum drawn. The object of this final vacuum is to remove the surplus creosote from the surface of the timber, thus making the wood dryer on the surface and cleaner to handle.

In the Rueping process, as the first step, air is pumped into the cylinder and thus into the wood under high pressure; then while this air pressure is maintained the cylinder is filled with creosote. As the oil enters, the air is gradually released, but without allowing the pressure to drop. In this way the cylinder is filled with oil, and a considerable quantity of air is entrapped in the wood at the same time. More oil is then pumped in and the pressure is increased. After the maximum quantity of creosote has been injected the pressure is released, the oil drained from the cylinder, and a final vacuum applied. This reduction in pressure allows the air entrapped in the wood to expand and force out much of the oil originally injected, leaving partly empty wood cells. The first injection on 8 pound Rueping treatment averages 16 to 20 pounds of creosote per cubic foot of wood.

Pine, of all the commercial species, is the most susceptible to preservation treatment. In a given cylinder charge, creosote applied as just described penetrates many poles throughout. Deep penetration is an all-important factor for it is practically a direct measure of the value of treatment —this because any kind of wood will check, and once the checks extend in beyond the creosoted layer, untreated wood is exposed to decay and insect attack. Deep creosote penetration, therefore, is a first essential to good pole treatment.

If the question were asked, "What is the outstanding feature in the service of creosoted pine poles?" this would be the answer, "They have the longest life of any kind of wooden pole, and during that life their strength remains practically undiminished."

The strength of pine is outstanding in that it is the highest, the most permanent and the most uniform of any of the pole woods. Exhaustive government tests show its modulus of rupture to be over 30 per cent greater than the nearest other pole species. What is almost as important is that 15 or 20 years after installation that strength is no less than when the poles first went into the line. Recently the American Telephone & Telegraph Co. tested sound creosoted pine poles 37 years old, and found them practically as strong as new.

As to uniformity, the bureau of standards after studying the plotted results of the load-in-pounds at which hundreds of test poles broke, pointed out that the strength of individual poles in the southern yellow pine group departed less from the average than any of the other species. That is, pine's strength is the most uniform.

In line construction practical advantage is taken of the foregoing facts in one of two ways, either by using smaller poles or by using longer spans.

The life of creosoted pine poles is not known. The oldest installations are still in use; their present condition is good, and there is nothing to indicate how much longer they will last. Several lines, cited here, for which records are available, show less than 10 per cent renewals in 25 to 30 years. In many lines 10 to 20 years old it has not been necessary to replace a pole. The remarkable thing is that these very old poles are still in apparently excellent condition. An increment boring taken at the ground line on a 25-year-old pole is of such appearance that if placed in a group of borings from creosoted poles just from the treating cylinder it could not be distinguished.

The attacks of white ants on poles are becoming an increasingly vexing problem. Once they gain entrance to a pole, nothing can stop them. An investigator for Stone & Webster has just published his discovery of white ant attacks in disturbing numbers in the New England states. The Western Union Telegraph Co. conducting studies on its own lines only a year ago learned to its surprise that white ant attack on poles was occurring in New York, Pennsylvania, and Illinois. Here is a paragraph from a paper by the Western Union construction engineer who has been studying this problem:

> It appears that attack by termites is so serious in southern California that in order to secure a satisfactory life, it may be necessary to employ only poles that have been treated the full length. But termite attack is not limited to southern California. We are finding that a great many of the poles which we replace in various parts of the country, have been more or less riddled by borers at and below the ground line. Evidently this condition is becoming wide-spread throughout the country, and poles are deteriorating much faster than by decay alone.

The white ant problem is serious. Any pole-using utility may well study it. The status of creosoted pine poles, with regard to white ant attack, is covered by this statement from government bulletin No. 1231 "Tests of Methods of protecting Woods Against Ter-

mites or White Ants." The bulletin says:

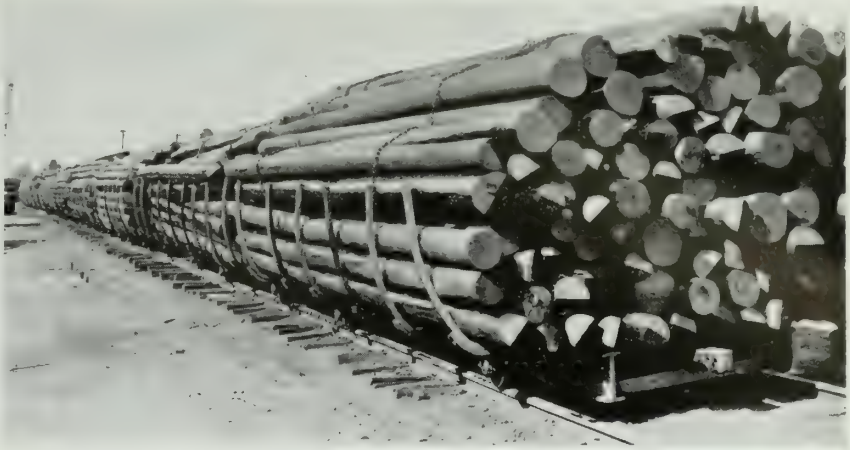
> The most effective preservative in protecting timber to be set in the ground from attacks by termites is coal-tar creosote. Impregnation by the full cell process with coal-tar creosote renders wood resistant for at least 25 years.

To touch briefly on two or three further points: There is the matter of conductivity, whether creosote affects the resistance of wood to the passage of current. This problem belongs to the electrical engineering field rather than to the field of wood preservation. A summary of engineers' conclusions is enlightening. The Southwestern Bell Report for 1924 said:

> The question is sometimes raised as to whether untreated poles are more suitable than treated poles for joint use with electric companies. This bulletin indicates that pole resistances are lowest when the pole surfaces are wet, and that under these conditions the resistances of treated and untreated poles are approximately the same. For these reasons, it is felt that as far as safe operating conditions and safety to linemen are concerned, treated poles are as satisfactory for jointly used lines as untreated poles.

A summary from the American Wood Preservers' Association conductivity committee, 1923:

> Poles—Your committee has decided that for all practical purposes the conductivity question as related to poles holds no interest for the following reasons:
>
> 1. The distribution engineer is concerned with insulator and crossarm resistance, the pole resistance forming but a small fraction of the circuit to the ground.
> 2. Creosote is the preservative in general use for pole preservation, and the experimental data show that it increases resistivity of timber.
> 3. Steel poles and crossarms are in common use on transmission lines.



A Charge of Poles Ready to Enter the Treating Cylinder.

In times past, and occasionally even now, the question is raised as to the use of creosoted pine poles on busy city streets. Some objection has been raised on the basis that their oily surface will damage the clothing of people who might come in contact with them.

With the advent of the Rueping empty cell process this objection has been largely eliminated. The science of wood preservation, like other sciences, has advanced greatly during recent years, and with the better knowledge of timber seasoning methods, of creosote, and of treatment, the creosoted pine pole, particularly when treated by the Rueping process, has but little objection on this score. Comparatively speaking, it is a clean pole. Hundreds of cities are using them on busy streets. A few examples are Brooklyn, Detroit, St. Louis, Dallas, Wichita, Lincoln, Neb.; De Moines, Springfield, Ill.; Raleigh, Ft. Wayne, Ind.; Oklahoma City, New Orleans, Atlanta, Los Angeles, Memphis, Little Rock, Greenville, Ky.; Arkon, O.

The foregoing has touched but briefly on the more important characteristics of the creosoted pine pole with relation to its service in the line. Let me add one vital point with regard to buying: Creosoted pine poles do differ in quality. They all look black on the surface, yet the service in your line depends on what is beneath the surface, the soundness of the timber, the quantity and quality of the creosote, and the thoroughness of the treatment. Price considered alone, the blind worship of the low bid, is suicidal to pole service.

One of the outstanding developments in modern pole business has been the substitution of a quality or a service motive for the price motive in buying. The trend of the cooperative supplier today is distinctly away from first cost, and toward the more substantial values that frequently are inconsistent with low price.

Typical View of Pole Seasoning Yard Showing Correct Method of Stacking Poles.

New Ferry Boats in Service

Three Diesel Electric Driven

By C. W. Geiger

THREE steel hull automobile ferryboats, the first of their kind to be constructed, have been added to the fleet of transbay craft operated by Southern Pacific Co. on San Francisco Bay. The Fresno, is now in service between San Francisco and East Bay terminals. It was launched at the yards of the Bethlehem Shipbuilding Corpn., Ltd., San Francisco, in January. The Stockton, second of the new vessels, was launched in the yards of the Bethlehem Co. March 5, and the third boat, the Tahoe, was launched by the Moore Drydock Co., Oakland, March 23. Both of these boats are now in service on San Francisco Bay.

The Southern Pacific Co. operates an automobile ferry line, in addition to its passenger ferry service, from San Francisco to Oakland, Alameda, Richmond and Broadway, Oakland. In 1926, the company carried more than 2,500,000 vehicles and more than 6,500,000 passengers on its automobile ferry boats.

The boats are Diesel electric driven and the engines are the Nelseco type supplied by the King-Knight Co. of San Francisco. The engines are 450 horsepower each, with four engines to each boat, a total of 1800 horsepower to each boat. The Southern Pacific has been increasing its service steadily, and the three new boats will be of material aid in maintaining the present frequent schedules and in increasing the service if traffic demands.

The new boats are equipped with the Ward Leonard type switching and control system for a double pilot house, and engine room control which permits the pilot to control the propelling power direct from the pilot house. All equipment in the boat is of the latest design and is the most modern equipment available. All the auxiliary equipment is electrically driven.

Commodious women's and men's salons, a smoking room, and a large, comfortable dining room, which is served by an electrically operated kitchen, are on the upper deck. The hulls of the boats are of steel and thorough consideration in its construction has been given to every safety factor. The main power plant in each of these boats consists of four 450 brake horsepower Nelseco diesel engines, each directly connected to a 275 kilowatt, 250 volt shunt wound, separately excited, direct current generator and, mounted on the safe shaft, a 40 kilowatt, 125 volt, compound wound exciter. These units will deliver the rated power at 230 revolutions a minute. The generators operate in series, supplying current at 1000 volts to the main propulsion motors which are of double unit type, shunt wound, and separately excited with forged flanged shafts. On continuous duty rating each of these motors will deliver 1250 shaft horsepower at 100 to 130 revolutions a minute with 500 volts on each armature.

The Nelseco engines are of the vertical, 6-cylinder, 4-cycle, single-acting, mechanical injection, full Diesel type, 15-inch bore by 22-inch stroke, each developing 450 horsepower at 230 revolutions per minute. The bedplate and housing extend the entire length of the working cylinders and are made of cast iron of extremely rigid design, the oil pan being cast integral with the bed plate. An angle section extends the entire length along each side. These are drilled for bolting to the foundations.

One of the Fine New Diesel Electric Driven Ferry Boats Launched by the Southern Pacific Co.

Box sections which act as seats for the main bearing shells tie the two angle sections rigidly together. The housing extends upward forming the crankcase, and this part has large openings on either side opposite each crank. The top of the housing is faced off as it supports the cylinder block. The cylinder block, which is of cast iron, is bolted to the top of the crankcase enclosing the top of it. The cylinder block is designed to allow ample cooling space around the cylinder liners, and space is also provided in the block for an air chamber for the air intakes, the openings of which are covered with slotted plates, the whole design being such as to silence the noise of the air intake.

The cylinder block and bedplate are held firmly together by large steel tie bolts extending the whole height of the engine and take practically the whole combustion load, thus relieving the cast iron bedplate, and cylinder block of this duty. The cylinder liners, which are simple cylindrical castings of special close grained cast iron, are machined on both sides, fitted into the block and held securely at the upper end, the lower being free to expand. A packing joint is provided at the lower end to prevent cooling water entering the crank case. The cylinder heads, of a special close grained cast iron, are provided with six cover plates, which may be removed for inspection or cleaning. Openings are made for the inlet and exhaust valves and the fuel nozzle. Special provision is made for the cooling water which is directed first at a high velocity across the under side of the head, as this is the hottest surface, and then at a lower velocity throughout the rest of the head. This system has proved especially efficient as it maintains the upper and lower surfaces at a more uniform temperature, thereby eliminating practically all distortion stresses and resultant fractures.

The inlet, exhaust, air starting, and safety valves, all of the poppet, spring loaded type, are carried in separate cages and so may be readily removed. Inlet and exhaust valves are interchangeable. The cam shaft is at the top and on one side of the crank case, being driven through spur gears from the crank shaft at one-half engine speed. It carries all of the cams for operating the inlet, exhaust, and air starting valves as well as for operating the fuel injection pumps. The entire camshaft assembly is enclosed by a sheet metal casing which retains the lubricating oil and serves as a guard.

Main bearings are of cast steel lined with bearing metal. The bottom half is a semi-circular shell, eccentrically machined so that it may be readily rolled out for inspection. The top half forms a solid cap. Shims are provided for adjustment. The crankshaft is of special carbon steel drilled for forced feed lubrication for the main and crank pin bearings. The forged steel connecting rods have a T-head for bolting to the phosphor bronze wrist pin bushing. The crank pin box is of case steel lined with bearing metal and is in two parts with shims between. The connecting rod is drilled for the forced feed lubrication of the wrist pin bearings.

Separate fuel injection pumps, operated from the cams on the cam shaft, are provided for each cylinder. The body of the pump is a solid block of steel, assuring tightness and strength, with drilled holes for the passage of the oil and for the valve chambers. The quality of fuel delivered to the cylinder is governed by the by-pass valve on the discharge side of the pump and controlled by the governor and hand throttle. The fuel oil flows from an overhead gravity supply tank, passing through duplex strainers before being supplied to the pumps. The fuel is forced from the pump through copper tubing to the fuel oil injection nozzle in the cylinder head, which breaks the oil into a highly atomized form resulting in clean combustion without detonation or an excessive rise of cylinder pressure.

The lubricating oil system is extremely simple since the oil flows by gravity from an overhead supply tank to a header with distributing lines to each of the main bearings. From these bearings the oil passes through the drilled crankshaft to the crank pin bearings and

The Mendocino, One of the Latest Developments in Ferry Boat Construction, Commissioned Not Long Ago by the Northwestern Pacific Railway Co.

from there up the drilled connecting rods to the wrist pin bearings. Separate lines from the main oil header lead to the cam shaft bearings and lubricate the cams and rollers. Oil draining down into the crank case is returned to the overhead supply tank by the lubricating oil pump which is attached to the engine.

Circulating water, lubricating oil transfer, and fuel oil transfer pumps are attached to the engines and are of the vertical, single acting, plunger type. The speed governor is also driven from the crankshaft and acts directly on the fuel oil pump by-pass valves.

The overall length of these engines is 18 feet 9½ inches, with a width of 4 feet 8 inches, and an overall height of 10 feet 1½ inches. The gross weight is approximately 80,000 pounds.

Silencers for the engines were supplied by the New London Ship and Engine Co., manufacturers of the Nelseco Diesel engines, and complete spares, under American bureau of shipping requirements, were supplied with each boat. Auxiliary machinery was supplied by King-Knight Co. of San Francisco.

There are three control stations, one in each of the pilot houses and one in the engine room. The pedestal type controller in the pilot houses gives the pilot complete control of the ship, he being able with this control to govern the speed, the direction of travel, being able to go immediately from full speed ahead to full speed astern, and having complete control of the steering motor. In going in a definite direction the speed of the boat is controlled by the pilot in the forward pilot house, and at the end of the trip the control is reversed to the other pilot house by the engineer in the engine room. In case it is necessary or desirable to control the boat from the engine room this can be accomplished by switching the control to the station in the engine room, and the signals from the pilot house be transmitted by means of the engine room telegraph.

There is in each pilot house, and in the engine room revolution indicators which will at all times indicate the speed of the forward and aft propellers, giving the pilot a very close check upon the speed of the boat.

The main propulsion control switchboard is in the engine room, and so arranged that no live parts will be exposed. The auxiliary generator is controlled from a separate switchboard in the engine-room, and the separate exciter switchboard is so arranged that one exciter may be used for excitation of the main drive generators and motors, and any two for supplying power to the auxiliaries, leaving one exciter as a spare.

Each of these three ferryboats is equipped with two Cunningham straight electric steering gears arranged for independent control of each rudder from the pilot house through Sperry Telemotors.

Ferryboats on San Francisco Bay are kept cleaner, perhaps, than any ferryboats in the world according to report by the California state board of health.

"Freight and passenger steamers of many sorts," says the board's report "are constantly plying the great inland waterways of California, the Sacramento and San Joaquin rivers and the Bay of San Francisco. For many months Edward T. Ross, state sanitary inspector, investigated the conditions upon a large number of these vessels in order to determine if they were kept in a sanitary manner.

"Conditions upon most of the passenger vessels were found very good, and wherever any unfavorable conditions were found, the owners made the necessary corrections at once, in compliance with the recommendations of the inspector.

"The bulk of the passenger traffic on these waterways is between San Francisco and the east bay cities of Alameda county. These passengers are carried by the Southern Pacific and Key Route boats. The Northwestern Pacific Co. and the Golden Gate Ferry Co. carry a considerable number of passengers between San Francisco and the cities in Marin county. In addition the Western Pacific and the Santa Fe railroads carry passengers between San Francisco and Richmond and Oakland. Besides the daily commuters carried there is a large number of transcontinental passengers.

"The cafes upon all the San Francisco Bay ferryboats were carefully inspected. The galleys were found to be kept clean and the foods well protected. Upon the Southern Pacific boats the heavy cooking and baking is done in sanitary kitchens on the wharves. The galleys are used chiefly for preparing short orders. The dishes and eating utensils are kept clean, and the refrigerators, in which considerable quantities of food are kept, have always been found to comply with the requirements."

Engineering Leadership

The widespread advertising campaign of one of the large automobile manufacturing companies which has placed these words, "Engineering Leadership," in letters two feet high on billboards all over the United States, is just another evidence that the interest and confidence of the American people can now be gained by assuring them that the men responsible for the products of certain companies and for the management of these companies are good engineers.

The Illinois Central System transported more than 21 million tons of coal in 1925. This is equivalent to 427,000 carloads, which would form four trains reaching all the way from Chicago to New Orleans.

"If you want to climb high, better stay on the level."

Montreal Greets Division V

Fine Record of 1926

By Harvey Brewer

TWO outstanding facts with respect to American railroads were emphasized in the great convention of Division V, American Railway Association, at Montreal, June 7 to 10. Surpassing in public interest and importance anything contained in the welter of detailed reports submitted by the various committees, these facts seemed adequately supported by the records:

That, in the last few years the railroads of the United States and Canada have made greater progress than at any other time in their history in the development of mechanical facilities; and,

More transportation has been delivered at a lower expenditure of coal, especially in 1926, than at any other time. For every ton of freight and equipment hauled one mile these railroads used an average of approximately two and one-half ounces of coal.

This means, put into the terse phraseology of L. K. Sillcox, chairman of the mechanical division of the A. R. A., that for every pound of coal or its equivalent used, the railroads hauled six and one-half tons of freight or equipment one mile, a record indicating efficiency in operation such as the past could never show.

In the somewhat prosy and decidedly technical papers of the committees, one looks in vain for mention of the very distinctly human efforts, the hard work and the loyalty which made such striking accomplishments as these possible. This kind of work is not done by high salaried officials, by great financiers in the world's money markets, in the pleasing glare of publicity and popular favor. It is not the work of any one great personality or of any little group. It is the concrete proof of employe integrity, of faithful labor, of great and persistent endeavor by practically all of the 1,800,000 men who make up the great railroad family of the United States, and the additional thousands on Canadian lines equally filled with pride and interest in their jobs.

Sir Henry Thornton, President, Canadian National Railways.

The reports ignore one other item which must be impressed upon railroad owners and the public in some way, and this is the very high degree of confidence and good feeling with which these thousands of employes must have been inspired by their leaders and official heads. And this is the executives' and the supervisors' overwhelmingly important task. Remembering that only a few years ago many thousands of these same men were ready to tie the railroads into inextricable knots to gain what they believed they should have, and one begins to realize what a really gigantic thing it is these railroads have done; one gets a new slant, also, on the underlying human features in such a convention as that which Montreal had in its midst in the early days of June.

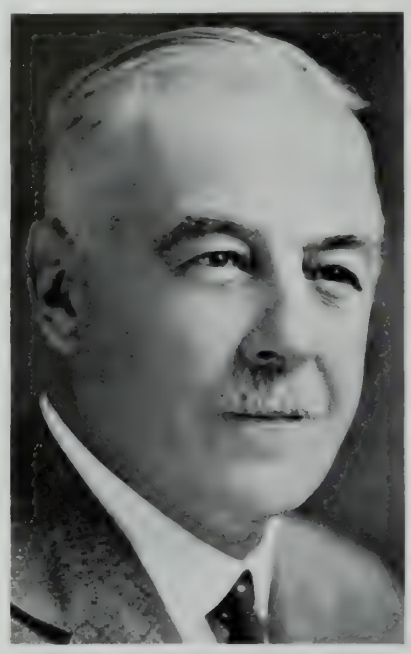
The outstanding personalities of all these A. R. A. conventions, no matter which divisions may be concerned, are pretty familiar to railroad readers. It is because of the records made under their direction that they have gained the distinction of being called outstanding. If personal contact, with its inevitable trend toward inspiration, the exchanging of experiences, the quiet lobby chats, were left out of the question, one might dismiss the conventions entirely. The reports to which some of the delegates listen are printed long in advance, and will be distributed widely long after the meetings have adjourned. The conventions are costly in time and money, but as the years pass their undoubted value for the reasons given, continues to grow until even the most confirmed pessimist begins to applaud their work. No man ever attended a convention of his business or craft without adding to his knowledge, his earning ability and his value to his employers.

Of course R. H. Aishton was there. Mr. Aishton, as all railroaders know, is president of the American Railway Association, and no convention of any division is thought to have been entirely successful without him. Ten days after the Montreal meeting he was talking encouragingly to the American Railroad Superintendents' Association, and the Protective Section, which means the railroad police, in their sessions at San Francisco, according to the press dispatches. Shortly after he

speaks the conventions begin to show new speed. He has a way of telling the men about things which, obviously, they ought to know but apparently never had thought about until he appears. It was this way at Montreal. Every man there knew mechanical facilities had been moving along pretty fairly rapid, but Mr. Aishton made them cheer about it. Because of the astonishingly favorable development, he said, the public in Canada and the United States is getting the best transportation service it has ever had. As he painted the picture it appeared like this:

The railroads, in 1926, handled the greatest freight traffic in their history, but they not only did this without car shortage or other transportation difficulties but also with an ownership of fewer freight cars and locomotives on their lines than in the year before. This year they own still fewer cars and locomotives, but due to the fact that they are constantly replacing obsolete equipment with cars and locomotives of more modern type and with greater transportation capacity, and the fact both freight cars and locomotives are being used more efficiently then ever before, the American Railway Association believes it possible to handle the traffic of the United States for some time to come with at least 100,000 fewer freight cars than are now owned by the railroads. Of course, he said, this recommendation is based on the assumption that there will be a continuation of the present economical use of freight cars and also an increase of one ton in the average to the car, which, with public cooperation, can easily be attained.

But Mr. Aishton had something to say about further possible economies. Numerous railroads, he said, have found that electrically controlled switch machines at remote points will not only facilitate the movement of trains, but will also bring about savings in labor and in train operation which alone will pay for themselves within approximately three years. By the development of automatic signals and the elimination of delays in terminals, the movement of trains has been expedited without the necessity for additional large capi-



R. H. Aishton, President American Railway Ass'n.

tal expenditures. Stronger and better freight cars are being built today than ever before with a view to increasing their capacity without increasing their weight. This is shown by the fact that freight cars now being built by the railroads with a capacity of 50 tons, weigh less than the 40-ton capacity cars which the Railroad Administration built a few years ago.

The trained scientist and the mechanical engineer, Mr. Aishton said, are now playing a greater part in the operation of the railroads than ever before. Housed in laboratories, often miles from the main lines of railroads, they are conducting extensive research work designed to bring about still further improvements and efficiencies in railroad operation. They are testing air brakes, for instance, with the hope of bringing about still further improvements, conducting researches in an effort to determine what improvements, if any, can be made in the construction of draft gears, the mechanism behind the couplers on cars that takes up the shock due to the starting or stopping of trains. Elaborate research work is being done to devise increased safety devices on tank cars, which, for the most part are used to transport gasoline, highly inflammable oils and corrosive acids. The railroads and manufacturers are trying also to reduce further the possibility of broken wheels and rails, and to reduce the stress on rails due to the use of heavier locomotives and cars.

The safety and comfort of passengers is under constant study. One tangible result is the fact that the lighting of passenger cars has been developed so that it is now easier to read a newspaper while traveling 60 miles an hour than it is in most homes.

Then Mr. Sillcox, who is general superintendent of motive power for the C. M. & St. P. Ry., when not presiding, took up the story and carried it on. Coal consumption was his text. He had the facts and the figures. It isn't known exactly, he said, just how much the nature of repairs to locomotives contributed to the reduction in the use of fuel, but it is a well known fact that a high degree of general locomotive maintenance, and boilers in first class condition produced results from a fuel standpoint beneficial to the cost of operation and transportation service as a whole.

The enormous investment in locomotives, necessary to maintain sufficient power so as to move the business offered at any time, Mr. Sillcox said, makes one of the first duties of successful management the maximum utilization of every engine. That the roads are succeeding in this effort is shown by the fact that the average daily miles of active locomotives on the Class I roads in 1926 was 85 miles for freight locomotives and 152 miles for passenger locomotives. In 1923, the average for freight

locomotives was 81.6 miles and for passenger locomotives, 142.6 miles. The increased work which locomotives are doing is shown by the fact that since 1922 there has been an increase of more than seven per cent in the average road speed, an increase of more than 18 per cent in the gross tons to the train, and an increase of nearly 28 per cent in the gross ton miles per train hour, while at the same time there has been a decrease of nearly 19 per cent in the amount of fuel consumed in hauling one thousand tons of freight and equipment one mile.

What Chairman Sillcox said was supported strongly by the talk of A. G. Pack, chief in the bureau of locomotive inspection of the Interstate Commerce Commission. He believed the marked improvement in the efficiency and economy with which the railroads are being operated is due largely to the fact their locomotives and other rolling stock are in better condition than ever reported in the past. As a result, he said, there were fewer accidents and deaths. All these elements, Mr. Pack declared, are reflected in the successful operation of all other business enterprises which depend upon safe, efficient and economical transportation.

Mr. Pack, it should be remembered, is not working for a railroad. He has a government job. He came pretty close to the great truth, too, when he added this gem to his speech:

"It matters not how well the president of a railroad may direct its financial affairs, how much business the traffic department gets, nor how well the operating organization plans the movement of trains, if the motive power and the cars are not ready and capable of delivering traffic to its destination safely and economically and with speed and dispatch, the public suffers. No one can estimate accurately the cost to the railroads and the public of an engine failure or the serious delay to a train. Train delays interfere with the plans of the operating department, destroy the morale of the men and frequently contribute to some of the most serious accidents involving the loss of life and heavy property damage. The cause of many serious accidents may be traced to small defects of an apparently insignificant nature, defects, the repairs of which are frequently minor. It is the little things that grow imperceptibly into big ones."

Then came M. J. Gormley, chairman of the car service division in Washington, with a lot of figures that satisfied. The addition of 608,777 modern, high-capacity cars, new or rebuilt, he said, the retirement from service of 552,358 low-capacity, inefficient cars; the placing in service of 11,049 locomotives since January 1, 1923; the cooperation of the shippers through the medium of the regional advisory boards and the important part they have taken in reducing the time required for loading and unloading of equipment, as indicated by the decreased demurrage assessments; and, to

Some of the Pioneers of Division V, Mechanical, in the Early Days.

This group picture shows some of the old timers who belonged to the Master Car Builders' and Master Mechanics' Association. It was taken some years ago at Atlantic City. We have been able to identify only about one-third of those shown. Many of these men were pioneers in the development of the great mechanical departments of our railroads. During their lifetimes they saw steam transportation develop from practically nothing to the giant organizations of which they were so proud. These were the boys who could say with pride that they "Deemed themselves fortunate that their lines in life had been cast alongside the lines of steel."

Reading from left to right, and beginning with the first row we are able to identify the following: Harry McCarthy, Galena Signal Oil Co.; F. W. Brazier, Ass't to General Supt. Motive Power, New York Central; John W. Lentz, Master Car Builder, Lehigh Valley; John T. Chamberlin, Boston & Maine; Wm. McIntosh, Supt. Motive Power, Central R. R. of New Jersey; Wm. H. Lewis, Norfolk & Western; Peter Peck; W. H. Miner; Dan Brady.

Second Row: Garrett, Farlow Draft Attachment Co., Joseph Maycock, Pratt & Lambert Co.; H. G. Hammett, Troy, N. Y.; John Reynolds, Railway Age; J. M. Barrett, W. J. Connors Car Equipment Co.; Wm. St. John, Safety Car Heating & Lighting Co.

Back Row: Johnson, Duff Mfg. Co.; L. F. Purpill, New York Packing Co., Hicks; Frank Edwards; C. H. Boaz; A. C. Noble, Pittsburgh Spring & Steel Co.; Charles Schoen, Schoen Steel Wheel Co.; Willard A. Smith, Railway Review, Eugene Chamberlin, New York Central.

some extent, an increase in the loading per car, were the main factors that made it possible for the carriers to handle the greatest traffic in their history, and, at its peak, have available a large surplus of equipment. Keep up this kind of record, Mr. Gormley said, and the railroads could handle the traffic of the country for some time to come with a total decrease in the ownership of open top and box cars of at least 100,000. The addition of large numbers of modern cars and locomotives, with improvements in terminals, reduction in grades, and so forth, has meant the expenditure during the last six years of $2,450,751,648 for equipment and $2,102,726,104 for other improvements, a total of $4,553,477,752. The other side of the story is that the operating expenses for 1926, when the heaviest traffic on record was handled, were $1,112,600,000 less than 1920. True, he said, this reduction was not all due to the improvements made in the physical plant but certainly the largest part of it was due to that fact.

Electric locomotives took a sly dig at their steam relatives in the interesting address of W. H. Bean, material manager of the New Haven. Mr. Bean described, "a record not equalled by steam service anywhere," and did it in this way:

"The 41 electric locomotives of the earliest type have been in service 20 years, and the total mileage per locomotive has reached about 1,250,000 miles. These locomotives still handle most important main line fast trains, and their record as to age, mileage, and character of service is unquestionably not equaled in steam service anywhere.

"The total electrified mileage on the New Haven is at present 672 miles. This electrification, initiated in 1907, was of great magnitude and, in the then state of the art, required great courage. The 11,000-volt, single-phase system now in use was adopted because it provided economical transmission of power and imposed no limit to the extension of the electrification. The extent of the flexibility is shown by the fact that it is possible to run on the same line a multiple unit train of from one to ten cars, a high-speed passenger locomotive, a motor-generator locomotive, and a gigantic constant-speed freight locomotive, such as those on the Virginian. On no other system has this been accomplished.

Sinclair Canyon, Canadian Pacific Railway.

"The locomotive motor which made the use of this system possible was designed by the late B. G. Lamme, chief engineer of the Westinghouse Company. The design was considered quite an accomplishment, because it had been believed that such a motor could not be built. Several small improvements have been made in the original, but it is still fundamentally the same. It is simple and gives good operating results.

"Electric passenger locomotives made 377,000 miles in October, 1926, or 214 miles per serviceable locomotive per day. The average locomotive mileage per day for all serviceable freight locomotives is 150. Electric switching locomotives have records of 4,300 to 4,500 miles monthly, and are kept in service 24 hours a day for as many as 30 days continuously."

Frank McManamy, member of the Interstate Commerce Commission, described the work of that body in his address June 8. He seemed satisfied with the record. "If it indicates anything" said he, "it is that since the beginning of railroad regulation the treatment applied has on the whole been sensible, wholesome and constructive. I shall not attempt to quote the figures but they amply support the statement that the results have been greater safety, greater efficiency, better service, better credit, better financial condition of the railroads as a whole, and a stability of value to the capital invested in railroads which it never before had."

A banquet was given Tuesday evening, June 7, when the principal speakers were Sir Henry Thornton, president of the Canadian National Rys., and Grant Hall, vice president of the Canadian Pacific Ry.

Under the present rules the terms of office of the chairman, vice chairman and seven members of the general committee should have expired last month, but the general committee, recommended extending the terms to two years to expire in even years, the committee on nominations reported this slate and it was accepted: For chairman, term to expire in June, 1928, L. K. Sillcox; vice chairman, same term, G. E. Smart, chief of car equipment, Canadian National Rys. For seven members of the general committee, terms to expire in June, 1929: A. R. Ayers, assistant general manager, New York, Chicago & St. Louis; F. H. Hardin, assistant to president, New York Central; O. S. Jackson, superintendent motive power and machinery, Union Pacific; J. S. Lentz, master car builder, Lehigh Valley; J. A. Power, superintendent motive power and machinery, Southern Pacific Lines in Texas & Louisiana; A. G. Trumbull, chief mechanical engineer, Erie, and S. Zwight, general mechanical superintendent, Northern Pacific.

Roller Bearings on Electric Lines

Sacramento Short Line Tests

By Frank A. Miller

San Francisco & Sacramento R. R. Co.

THE earliest attempts to apply anti-friction bearings to the journals of railway rolling stock date back many years. All these early attempts were uniformly unsuccessful because the bearing used, whether of the ball or roller type, did not show sufficient reliability and life in service to warrant any extended application. Such tests as were conducted, however, did show that the use of these bearings would afford some decided advantages from the operating standpoint, particularly with regard to the reduced starting resistance. After these sporadic attempts, there was a period of comparative inactivity in this field, railway mechanical officers apparently being of the opinion that no bearing manufacturer had yet developed anything which would show sufficiently long life to warrant serious consideration.

That some attractive operating advantages would accrue from the use of anti-friction bearing journals was clearly indicated by these early attempts, and further evidenced by the large number of applications which have for a number of years been in use on some of the European railways. The World War prevented any further attempts, and nothing more was done until about five and one half years ago. Various isolated attempts have been made with a few cars, but in most cases these tests have been to determine the reliability of the bearing in service, rather than to find out what operating economies it might effect.

The experience obtained to date shows very definitely some of the operating advantages which may be expected, but it has not yet been sufficient to afford a complete study of the problem. One of these tests has been in operation on the Sacramento Short Line for the past four years.

In November, 1922, we placed an order with the Stafford Roller Bearing Car Truck Corpn., for one set of bearings. It was to replace the standard 5x9 bearings, and to have boxes that would fit into standard Baldwin trucks. These bearings were purchased under a guarantee of workmanship, service, stability, for a period of three years, the manufacturers at that time anticipating 450,000 miles of service. These bearings were of the straight roller type, 5/8 of an inch in diameter, and were made up in two rows, one row staggered 1/2 width of the roller from the

—Paper delivered before the convention of the California Electric Railway Ass'n., Los Angeles, June 20-21. Mr. Miller is superintendent of power and equipment for his company.

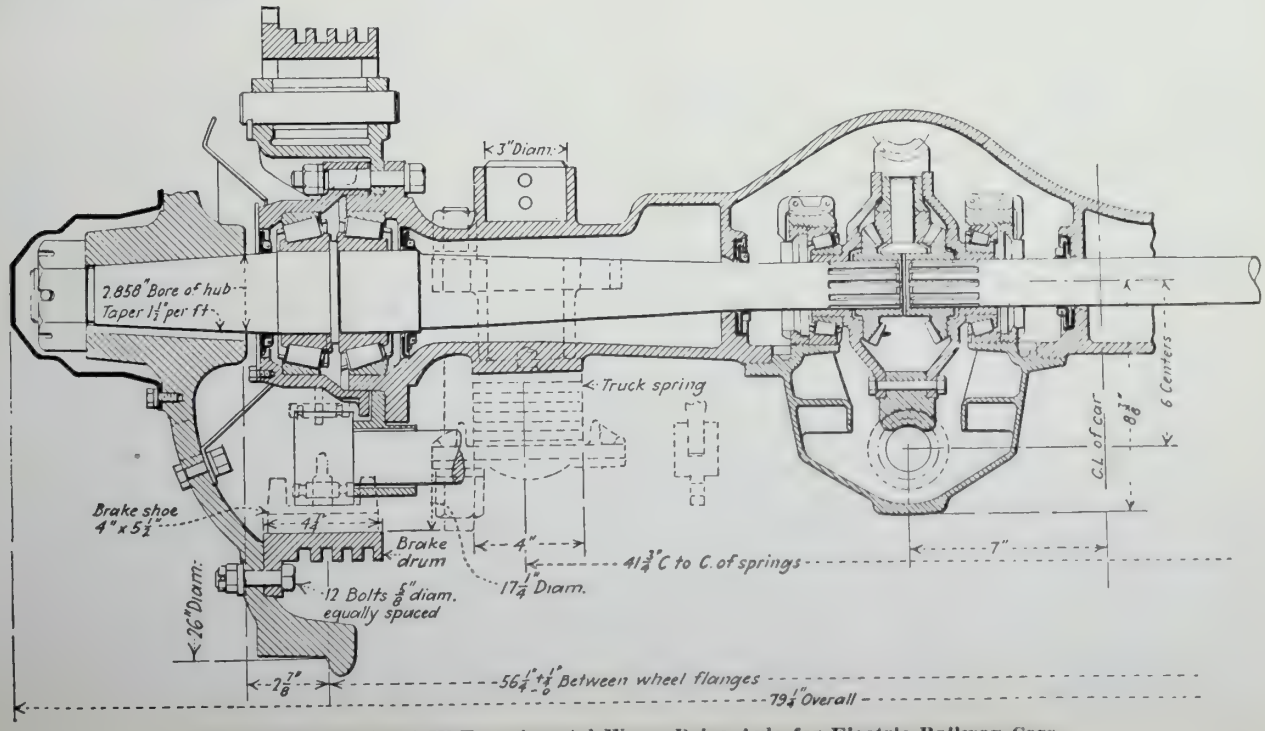


Fig. 1. Timkin's 63010-W Experimental Worm Drive Axle for Electric Railway Cars.

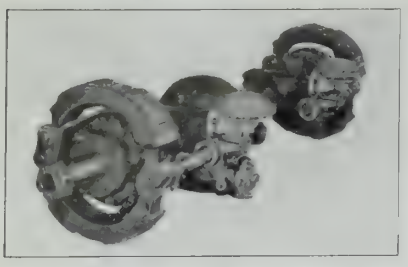


Fig. 2. End View of Worm Drive Axle With Wheels and Brake Drums Removed.

other and held in the cage by trunnions. Thrust bearings made of two ¾ inch plates one engaging the end of the axle and the other engaging the cover on the box, between which there is a set of radial roller bearings. The standard 5x9 axles were turned down to M.C.B. condemnable limits, and a ¾ inch thick hardened bushing pressed on the axle. The inside of the box was lined with a ¾ inch steel bushing. The back of the box was arranged to hold lubricating material by having two concentric type packing rings which pressed against the axle. These boxes contained no reservoir for lubrication except the lubrication that would be held between the rollers themselves and the outer end of the box where the thrust bearing is situated.

Bearings were installed and ready for service under a steel trail car having a total weight of 60,100 pounds on April 17, 1923. The following tests and the results were as follows:

First, starting test. The car which stood on a level piece of track, adjacent to another car between which was placed a hydraulic ram, and by the use of a boiler test pump and test gauge, the following pressures were exerted against the bumpers to start the car:

The car first tested was the car with the roller bearings. This required 176 lbs.

Another car of exactly the same type but equipped with plain bearings was placed in the same location and the same test applied, and required 1069 lbs.

The test showed 5.8 lbs. per ton for the roller bearing car and 35.5 lbs. for the car with plain bearings.

An acceleration test was made as follows: The car with roller bearings was attached to a standard motor car weighing 93,000 lbs. and a trip made of 2-7/10 miles in one direction, making 5-4/10 miles round trip.

The train was moved to a point where the track was practically

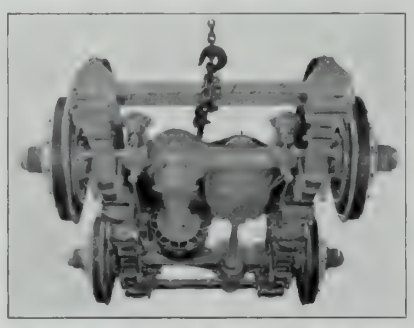


Fig. 3. View from Underneath Truck Equipped With Worm Drive Axle.

level on this trip and stopped. It was then accelerated to Series and stopped, then accelerated from Stop to Parallel and stopped. The train was then returned to the starting point where a trailer with plain bearings was attached to the same motor car and train taken to the same place and the test repeated.

The results of this test were as follows:

From Stop to Series showed a difference of 33 per cent in power consumed. The second test Stop to full Parallel showed a difference of 28½ per cent. In this short run of 5-4/10 miles round trip the difference between the two runs, car showed a difference in power consumed of 17-3/10 per cent. The power was measured by an economy meter which had been calibrated and was installed on the motor car.

Running tests. Three schedule round trip tests were made with each type of car. The train consisted of a motor car and a car with a plain bearing for the first three days, and for three days following the car with the roller bearing was attached to this train. Each one of these trips consisted of the train operating 180 miles.

The results of these tests were not particularly encouraging. That is, the information procured did not indicate that a saving of power would be effected.

The test was made on a local train which made an average of 27 stops in the going direction and an average of 18 stops returning. The average minutes stopped in the going direction was 27; the average minutes stopped on the returning trip was 19.

The power consumption for all

Fig. 4. Worm Drive Car Built for the Springfield Street Ry., Springfield, Mass.

trips was about the same, while a study of the log indicated that no two days were comparable.

In order to balance this test so that the information would give a comparison by actual road performance, was found impracticable. However, tests were made on short stretches of track where a train could be brought to a point of a free running speed. These tests indicated 10 to 12 per cent difference.

It is to be remembered that in these tests only one car of the two-car train had roller bearings, and it is expected that additional savings would accrue when the motor car is equipped. During the tests riding qualities of this car as compared with the plain bearing car was noticeably improved during the starting period, when the controller was put on the first point, this was the only jerk experienced, even when the car was being started on a 2½ per cent grade. None of the other notches of the controller could be felt.

There is also a noticeable improvement in the riding in the car when rounding curves, and particularly during the braking period.

No actual tests were made on coasting, but it was found that this

Fig. 5. Interior View of the New Cars.

car moved so easily that it was necessary to use hand brakes when standing in yards, as the car could not be left at any point on the line where the track was almost level without it moving off of its own

Fig. 6. Side View of Chicago & Joliet Electric Ry. Truck Equipped With Worm Drive.

accord, and it became a practice immediately after it was placed in service for yardmen to take hold of the grab handles and connect the automatic couplers.

Soon after this installation was made an interesting experiment was tried. We had two trains, one each between Oakland and Sacramento doing local work. It was necessary to use two motor cars on this train in order to make the schedule. This car was placed on the train instead of a motor, and no trouble was experienced when making the schedule.

It will be seen that from this test where we had used two motor cars weighing from 90,000 to 95,000 pounds each we could substitute a trail car for a motor car, leaving some 30,000 pounds of weight at home, with the necessary maintenance for the electrical equipment on the motor car.

After these bearings had been in service about 5,000 miles, on opening and examining the boxes it was found the lubrication which had been installed in the outset, had almost entirely disappeared. In removing the boxes from the trucks it was found that the glands in the back of the box which were supposed to hold the lubrication had absolutely no effect whatever on holding the grease.

This matter was taken up with the manufacturers who supplied the necessary material to change the design of the box. This was done by shrinking on an oil thrower ring in back of the roller bearings, turning out the back of the

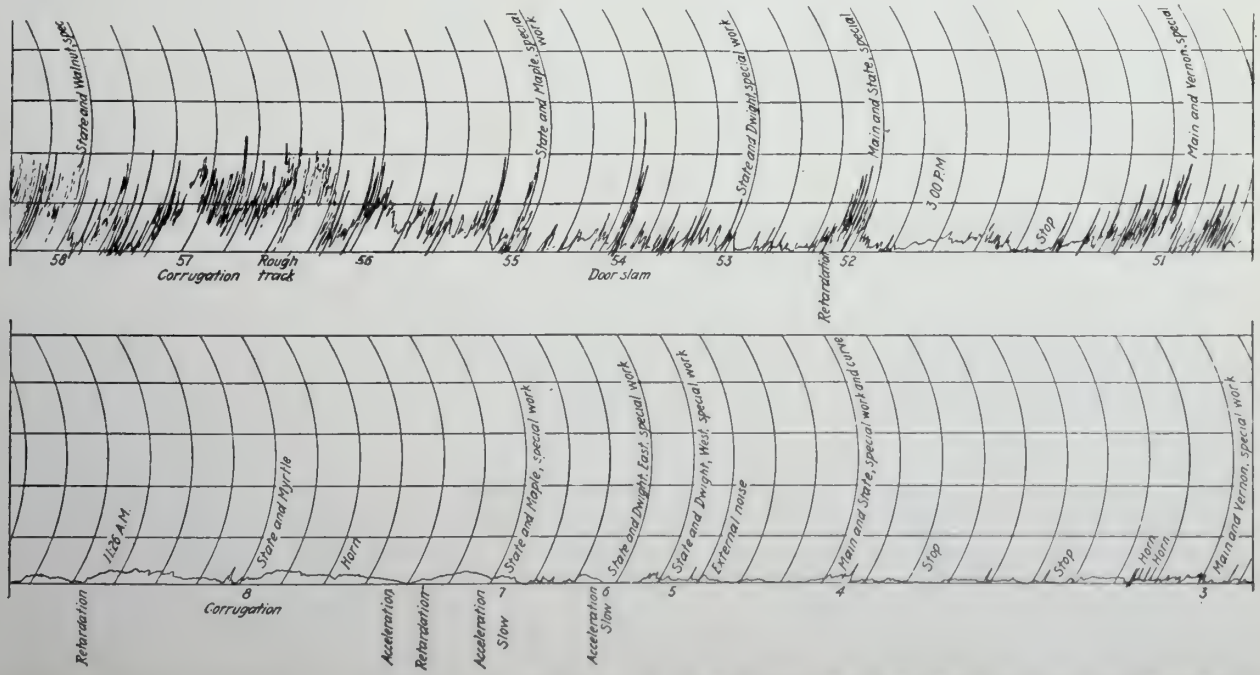


Fig. 7. Noise Measurements Made on One of the Older Cars of the Springfield Street Ry. Compared with the New Worm Gear Drive Car on the Same Road. Originally Printed in the Electric Railway Journal.

boxes and installing a flat ring which was cap-screwed into the back, inside of which was a V-type piece of felt which engaged the axle.

After the installation of these new oil retainers the bearings returned to service and aside from some minor cases of trouble which occurred due to the design of the nut which had been threaded on to the end of the axle and caused trouble with the thrust bearings, these bearings gave very good service.

At the end of about 75,000 miles the bearings were removed from service for examination. The rollers were found in good condition and bushings showed 1,000 to 3,000 wear.

In October, last year, trouble occurred which appeared due to the rollers getting out of alignment because of the design of the cage which held them. One of the roller sections was entirely destroyed, taking with it the inner bushing also, and the bushing on the axle. This required the installation of an entire new unit.

The bearings up to this time have made 142,801 miles; 136 pounds of grease has been installed, or about one pound per thousand miles. This, however, includes the entire renewal of grease during the overhauling periods. After testing these bearings in service for four years the following results from their use appear obtainable:

Trail cars can be used instead of motors in some cases.

Improved efficiency through reduced starting resistance and improved coasting qualities.

Improved service by elimination of detentions due to hot boxes.

Greatly reduced starting resistance and smooth starting of cars.

Improved riding qualities and control of tendency for car to nose by the elimination of lateral.

It is difficult to create a figure, even an estimate, as to what may be saved by the use of these bearings. Many factors enter into the saving, a few of which are:

Lower maintenance costs on electrical equipment due to the smaller amount of current necessary during the starting period.

Reduced operating costs by saving labor and material required for maintenance of plain bearing equipment.

Lower cost of maintenance of substation equipment due to lower peaks.

Elimination of wear on axles and present necessary replacements.

In locations where demand factors affect power bills, it may have considerable effect, due to the smaller current necessary in starting large groups of cars in rush hours.

The saving in power which can be obtained at the usual operating speeds is debatable. This refers to speeds above 40 M.P.H.

The volume of business done by the roller bearing manufacturers thus far has been small, but nearly all lines are engaged in experiments with this type of equipment, and engineers believe that the advantages are such that the change is inevitable. At present there are three principal manufacturers, their products are being tested by different companies under various conditions of railway service. These applications cover street cars, multiple unit cars, steam road coaches, gas electric, locomotive engine trucks, hand cars, speeders, etc.

Mileage in excess of 600,000 already have been obtained on one of these tests.

The largest single order to date has been 127 passenger cars for the Chicago, Milwaukee & St. Paul Ry.

The bearings offered by these manufacturers are all of the roller bearing type but vary considerable in principle.

The Timken bearings employ two sets of rollers having a maximum pressure on the outside, thus forcing the oil toward the center and assisting constant lubrication.

The Hyatt bearing has a straight roller in two sections non-opposing, and thus necessitates an end thrust washer to take up lateral strain while the S. K. F. is similar to Timken's except the bearing is a self-contained spherical, non-adjustable unit mounted on the axle; the single bearing carries the combined dead weight and lateral thrust.

Two of these manufacturers offer boxes to fit standard pedestal jaws of present day trucks. The only work required is the change in the end of axle. All three bearings differ in this construction due to the design of bearing. Two of these bearings use grease for lubrication while Hyatt uses regular journal oil as used in present boxes.

The question of deterioration due to the action of current passing through these bearings is still one to be considered although manufacturers believe the generous contact surface which the roller bearing possess will be sufficient.

Lubrication on a 5,000 mile basis is recommended but it is expected this will be increased to 25,000 miles as soon as these new bearings are better known.

Relative to guarantees offered by manufacturers at present, I had occasion to see a quotation wherein a manufacturer guaranteed to replace any defective parts in the bearings, no matter for what cause, in the first seven years of service. Further that if these bearings showed more than 5 per cent of trouble in the whole installation before 200,000 miles had been operated, the buyer would have the right to turn the whole installation back to the manufacturer.

This I believe gives a good idea how the manufacturer feels about his product. The trend of roller bearing application in passenger car design is examplified, I believe, in an individual paper presented before the A. R. A. at the present session on "Passenger Car Construction" by G. E. Smart, chief of car equipment, Canadian National Rys. He says:

The roller bearing is now a very live question and a number of railroads are testing out different types which have been developed and which are now on the market, and from the results of such tests as they have made so far it would seem that further exhaustive tests should be made with the idea of finally perfecting the design of this class of bearing to such an extent as to warrant its universal use, as the saving in tractive effort required in handling a train equipped with roller bearings is so considerable and so revolutionary that it may even eventually tend to reduce the power unit.

One of the most noteworthy additions to the electric railway field from a roller bearing stand-

point is the experimental worm-drive Timken axles for electric railway cars. The manufacturers believe this axle should accomplish the following: Lessen noise because:

(a) Worm gearing is an inherently silent form of final drive.

(b) Worm drive axles will permit the use of a differential, which eliminates wheel slippage on curves. Fig. 1.

(c) The axle housing provides a direct means of mounting the brakes. As the brake shoes are of the internal expanding type and operate on brake drums instead of on the periphery of car wheel, chatter is eliminated.

(d) An extravagant amount of loose, rattling linkage and toggle for operating the brakes is eliminated. Fig. 2.

(e) Excessive end play in axles, which is a source of noise, is eliminated. In the conventional electric car truck construction, end play is discernible to the eye. This can be verified by following a street car. The end play of the Timken tapered roller bearing is from .003 in. to .007 in.

(f) The motors are mounted on truck frame and not on the axle, thus eliminating possible noise from loose motor journals. Fig. 3.

(g) Motors are mounted on spring suspended portion of truck, thus reducing unsprung weight and relieving the pounding effect on crossings and special tract construction.

Two of these experimental cars have been placed in service, one at Springfield, Mass., by the Springfield Street Ry. and one at Joliet by the Chicago & Joliet Electric Ry. The Springfield car weighed 23,450 lbs. and seats 45 passengers. Numerous unusual features have been embodied in the truck design. Disc steel wheels of 26-inch diameter are mounted on differential axles of the automobile type which revolve on tapered roller bearings. The truck is of steel with eye beam side frames inside the wheel. The wheel base is 6 feet. Coil bolster springs carry the weight of the car body up to ¾ of the seated load in addition to semi-eliptic springs mounted in seats provided with Mack rubber shock insulators are used at all times. This truck design is a joint development of the Wasson Mfg. Co., the Timken Detroit Axle Co. and the Springfield St. Ry. Each of the trucks carries two Westinghouse B-91-B 300 volt motors connected permanently in Series. Variation in speed is obtained by placing the pairs in Series and in Parallel. Each motor is attached through rubber blocks to the truck frame with its shaft parallel to the direction of the motion of the car. It is connected to the remote axle of the truck through a flexible spicer propeller shaft. The gear reduction is 10 to 1 permitting the use of small high speed motors weighing 424 pounds each, as compared to the present modern Westinghouse 328 which weighs 1680 lbs. The worm drive operates in a bath of oil. Universal joints between the motor and the axle permit placing the motors well up on the truck frame where they will be out of the way of water, snow and slush. Brakes are of the internal expanding type similar to those developed for buses. They were designed by the Westinghouse Traction Brake Co.

Instead of a brake cylinder mounted midship and connected to the brake shoes through the usual street car type of foundation brake rigging, eight small brake chambers are substituted. One brake chamber operates the brake shoes in each wheel, and is placed in such a position that only one lever is required for each shoe. The brake chamber makes use of a diaphragm instead of a piston, and in the using eliminates any possibility of leakage at that point. A hand operated slack adjuster is built with the cam shaft that permits of easy and rapid take up of slack.

The composition inserts used as shoes were made especially by the American Brake Shoe & Foundry Co. The truck weighs only 5,650 lbs. complete with motors and drive shafts. This truck uses a bolster of the swing link design. Although the trucks for the Springfield car and the Joliet design are similar in many respects, they differ in several important features. A solid bolster is used in the Joliet truck, and the frame is of different design and the gear ratio is 8½ to 1 instead of 10 to 1 used by Springfield. The car was built by the Cummings Car & Coach Co. This car is 45.1 long, 8.6 in. wide, seating 51 passengers and weighs 24,600 lbs.

Since the light weight of this type of car is small in comparison to its loaded weight, there is an unusual range in braking effort to bring the car to a stop in the same distance under the extreme conditions. As a result a variable load type of brake is being developed similar in some respects to that in use on older forms of traction cars. This particular equipment is so new that data on it is not yet available, but we thought that it would be of interest to you to learn of the older type of variable load brake, and it is for this reason that we have asked the Westinghouse Air Brake Co.'s representative to give us a brief description of this equipment. One interesting development in the test to this car is the noise curves which have been made.

In common with practically every other mechanical device introduced in the railway field, the development of the anti-friction bearing must necessarily be slow. Its progress to date, however, has been sufficient to show some attractive possibilities, and is worthy of the careful consideration of operating and mechanical officers.

It is not reasonable to expect that railroad men will rush into this development, but the progress already made does warrant the bearing manufacturers in expecting their cooperation to the extent of showing, through the medium of a few test cars, what anti-friction bearings will do. The developments should proceed primarily along technical lines, with each person concerned familiarizing himself with the other's problem. In no other way can its ultimate success be assured.

Among the Men Who Do the Work

Some Remarkable Records

By William Lawton

Wide World Photos.

Conductor C. F. Rexinger, 72 Years Old, of Elkhart, Ind., and Engineer Miller Fleming, 77, also of Elkhart, First Engineer on the New York Central's 20th Century Flyer Which Celebrated Its 25th Anniversary a Few Days Ago.

THE superintendent was in a contemplative mood. "Yes," he said, in reply to the visitor's suggestion, "You're right. The engineer has a real job. I think we all look up to him somewhat, even when we won't admit it; it might make him a bit hard to handle. Most of them are pretty serious, level headed chaps with a full understanding of their responsibilities.

"But I don't care how serious he is or how smart he wouldn't stand much chance for his life or the lives and property in the train behind him if the track and the bridges aren't right. A good many persons forget the section foreman and his gang, but the engineer and the fireman keep him in mind I suspect.

"The section foreman is right at the bottom of the whole business of safe transportation. I'm not sure that he gets his full share of credit, especially in the public mind. But this is not the public's fault. Mr. Public doesn't think about the section foreman simply because he never hears anything about him. Some railroad president or chairman once said the foreman very often is a more important asset than the president himself. By this he meant, of course, that if the foreman and his men failed in their work everything else was useless. I never forget him. Every time I look over a well kept section I get a thrill out of it. Rails dead straight. Every joint and center right. The spikes and plates tight. The ballast clean, even, beautiful. I never forget the section men."

The right kind of a section foreman literally owns his six miles of track and right of way. It is his pride in life. To keep it in perfect order is a joy although he might not describe it in just those words. If he is an old timer, familiar with the days when hand cars were used, when he and the men pumped themselves over the section to work in the early morning and pumped themselves home at night he finds a keen pleasure in contrasting those experiences with the comparative luxury he and his men now enjoy in using the motor car given them. Progressive managements know how important it is to have men spend their strength on the track work instead of on the business of getting to the work and back again.

The section men are not usually very well known because their's is not a spectacular job. But they are never forgotten for a minute by the head of the road.

June produced some interesting records of section foremen in different parts of the country. One of the interesting stories came off the Frisco Lines—Wilmot, Kan., where T. R. Conway has been a section foreman for 20 years with an especially fine record of careful and loyal devotion to duty. President J. M. Kurn gave the matter his personal attention by writing a letter to Conway praising him generously for his excellent supervision over the section assigned him.

During his 20 years' service, Section Foreman Conway not only has never had a personal mishap while performing his more or less dangerous duties, but he has so carefully instructed his gang of six men that none of them has ever suffered a reportable injury. A total of 300,480 man hours of work has been performed by Conway and his six track laborers in the 20 years, figuring eight hours work a day, less Sundays, for that period. During this time the men performed such customary section duties as reballasting, laying rail, relining track, tamping, tie replacement and other work in which accidents are often recorded.

The unusual record first came to the attention of H. W. Hudgen, director of accident prevention, Frisco Lines. Conway began his Frisco service in 1897 as a track laborer and his first work was done in a gang bossed by his father.

On the Louisville & Nashville a diamond service button was awarded in June to J. F. Underwood of

Chemical Weed Killer Used on the Rock Island Lines, Near Eldon, Mo.

Dahlgren, Ill., for 50 years of faithful and active work. Underwood began his service on the L. & N. in April, 1877 at Dahlgren as a sectionman. Ten years later he became foreman. In all his long career only one man under his jurisdiction has been injured, and this was the man's own fault. What has been this foreman's conception of his job during all this half century? He answers the query this way:

"It has been my policy to give the L. & N. my best efforts regardless of material and force, and I have been fortunate in working for officials who have always appreciated my efforts."

In the office of the Missouri Pacific R. R. at Van Buren, Ark., is the record of one of these faithful servants of the people and of the road, who, through 37 years has stayed on his job and for 32 years as section foreman for his road, without losing a day on account of sickness and only 45 days for rest and vacation. This is L. W. Mickel at Lamar, Ark.

You have to feel an interest in experiences entirely outside your own easy path in life to grasp the humanities in a record like this. The chances are you may not know much about self-denial, hard work, loyalty, low pay, big accomplishments out of small opportunities. It will do you a world of good, if this is the case, to ponder over the record of L. W. Mickel. It may give you new courage.

Mickel started his humble career at $1.10 a day—a ten hour day. In 1894, when he was raised to section foreman his wages were increased to $50 a month for a ten hour day, with no extra pay for extra time. When there was extra work he stayed on the job until it was done. In times of storms or other calamities he was always on the job, repairing the track, calling out his crew of men in the night or whenever there was need

During his time of service he had under him more than 300 men and not one of them ever heard him swear, or saw him use tobacco or liquor in any form.

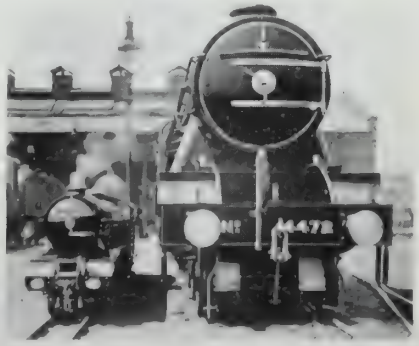
Foreman Mickel has never lived in a section house. In 1894 when he was promoted to foreman he married and bought a home in Lamar on a salary of $50 a month. In 1901 he bought a farm of 120 acres one mile from Lamar, paying down $2.50 in cash for the first payment and the rest in installments. At the end of five years the farm was free of debt. Here at his own beautiful farm home, called Three Maples, he has reared an interesting family of three girls and two boys. The boys have followed their father's occupation and are both in the employ of the Missouri Pacific. Argus, the elder, is section foreman at Piney, and the second boy, Rhenal, is a brakeman. If you still find it difficult at times to struggle along on $100 or $200 a month give a thought to Foreman Mickel, his home and his farm, and his girls and boys. The really important thing to consider is not, how much do you earn but what do you get for the money you spend? What will you have, 30 years from now, to show for the work you have done?

The glory and satisfaction of work well done, the pride and pleasure to be found in that work are not elements reserved for the higher-ups. Lee M. Reedy is a blacksmith for the Rock Island Lines in the Silvis shops. This kind of blacksmith doesn't shoe horses. Reddy says the importance of a job is not in the job itself but in the service and efficiency developed. "Blacksmithing," he says in the employes' magazine, "being one of the oldest, if not the oldest of trades, is interesting owing to the fact that a man has to form each and every piece by his own ingenuity unless it be machine forging or drop forging.

"My work consists mostly of making and resetting all cab operating parts which perform a very important part of locomotive operation, as each piece has to work evenly and smoothly so as to give the engineer full control of his locomotive at all times. The heating and care that has to be exercised in the performance of a job to see that the material is not injured by over-heating or by galds or fractures is important. The blacksmith must be careful in selecting the proper grade of material for each job, and when in doubt, it is always advisable to consult his superior. The materials most commonly used in locomotive repairs are carbon steel, vanadium steel, mild steel, enginebolt iron and common iron.

"I always endeavor to give the best of my ability to my work so as not to reflect any failures or returns on my foreman or the forge shop in general. Therefore, the importance of my job lies in turning out a manufactured product that is reliable and dependable for safe and efficient operation."

Is that the way you think about



—Herbert Photos

The Famous "Flying Scotsman" on the London & North Eastern Ry., and Its Miniature Replica of the Kent Light Railway. The Little One is One-Third the Size of the Big Boy.

—Wide World Photos

The Engineer Talking by Radio to the Brakeman in the Caboose a Mile Behind Him.

your job, or are your eyes overworked watching for the pay car?

The country, thank goodness, offers many fine examples every month of great loyalty among railroad employes. In two months recently, on one medium size eastern railroad 29 men and women were placed on the roll of honor. An engineer, a switchman and a yard clerk each discovered a broken rail.

A trackwalker found a broken rail and flagged a train.

A conductor saw a broken wheel on a passing train and immediately notified the dispatcher.

One brakeman discovered a broken tread on a car; another found a dragging brakebeam. The engineer, conductor and brakeman of one train discovered a broken tread on a car in a passing train. A trackwalker found and promptly reported a broken bolster under a car. A conductor found a broken flange on a wheel and had the car set off. Another conductor observed a derail on a curve and safely stopped his train. Another conductor discovered a broken arch bar. A section foreman observed a car off center and reported it before it could cause a sideswipe. A station agent found an obstruction in a switch frog and had it removed. A telegraph operator reported a brakebeam down on a passing car. A baggage man removed an obstruction from the track and prevented delay to a number of trains. A car inspector prevented the robbery of a merchandise car in a yard.

But perhaps even more significant were the friendly services of seven citizens—six men and one woman. One citizen discovered a broken rail; another reported a tree fallen across the track, breaking the telegraph wires. Another reported a broken frog. Another offered unusual services to a sick employe. Another flagged a train when a grading machine used on the roads got stalled across the track at two o'clock in the morning and waited two hours to flag the next train.

The seventh citizen was a married woman. All she did was to discover a tunnel caving in on account of a landslide and promptly notify the railroad agent!

Otherwise life went on very much as usual. But perhaps what these 72 employes and seven citizens did in these two months was merely what thousands of other employes and citizens would cheerfully do in case of need.

Radio Used on a Freight Train

Word came from Schnectady, June 15, that a locomotive engineer sitting in his cab conversed easily with a brakeman in a caboose at the rear of a freight train a mile and a quarter in length by radiophone. The tests, conducted by engineers of the General Electric Company and railroad officials, demonstrated the practicability of freight train operation by radio.

Things that logically ought to happen, do happen—but often not half so soon as they should.

Most people worry about their lack of dollars when they should be worrying about their lack of sense.

—Wide World Photos.

Locomotive Equipped With Radio Antennae, Used by General Electric Co., in Recent Tests.

Editorial Comment

The Editorial of This Edition

A DIVISION superintendent, if he knows his job, and most of them do, is or can be the biggest man on the railroad he represents, in his region. In many places he is, really, the whole works. The president very often is a mythical person whom nobody knows. His name, of course, is familiar. He's the man who turned down the petition for a new station, or the shops were moved to another town 50 miles away because of his economy, and what the town says about him is aplenty. The president is said to be hardboiled, and when he goes through town in his "private" car he goes fast, with the shades drawn. The silly town doesn't know there are no strictly private cars on railroads. So, it hands the president any raspberries available, metaphorically speaking, and turns to the superintendent.

The superintendent comes to town usually to square things. He knows the leading banker by his first name and probably could borrow money from him. When he faces the commercial club meeting he speaks a language the members understand. Some of it he learned in a switch shanty. The people like him, if he's wise enough to make them, and if he keeps up on current events and knows his road's exact financial status, as superintendents should, he can make the members adopt a resolution favoring higher rates before he leaves town. The superintendent, like the village smithy of blessed memory, a mighty man is he.

Until Number Two pulls into the yard with the 29A on the rear end nobody knows just where the superintendent is at, as they say in Texas. No bands precede his coming. He isn't expecting any applause and consequently seldom is disappointed—for a superintendent has many unpleasant tasks and much hard work. Ralph Waldo Emerson must have had some division superintendent in mind when he wrote, "The power which resides in him is new in Nature, and none but he knows what that is which he can do, nor does he know until he has tried."

Many unpleasant tasks. The superintendent must poke around here and there, into this and that when least expected, at the same time doing what he can to preserve the perfectly futile tradition that the superintendent never does any snooping. He must have the men's good opinion if he can get it without surrender; he must get the work out of them, keep the whole line up in apple pie order, know every other man's job, including engineering, stay out on the line so much that his children refer to him as "that man that comes here some times." He must report everything imaginable to everybody, treat his private secretary as humanly as possible, and try to get to bed before it's time to get up.

He doesn't always find it possible to do so, but the superintendent is expected to attend all the meetings of everything, on the road and off. It is his job to encourage men to do all kinds of discouraging things, very often with tools and equipment that were obsolete when Texas went Republican, and that was a long while ago. He must make the men in all departments believe the railroad's prosperity means prosperity for the men and the communities in which they live; he must convince them, as Edmund Burke said, that success is impossible for men who are not bound together by common opinions, common affections and common interests.

Consider these indispensable attributes and you will realize how interesting was the national convention of the American Railroad Superintendents' Association at San Francisco, the latter part of June. These men know life, they know railroading, they understand the public chiefly because, unlike the presidents of the roads, they still venture into the smoking car where there are real human beings, lacking—some of them—in the gentleness and gracious affability of a Chesterfield, it is true, but a very important element in making up a cross section of American life which formulates public opinion. They are practically all approachable men, these superintendents, kindly disposed, pleasant to meet, interesting. One reason for these qualities is found in the fact that division superintendents all come up from the ground while presidents very often start half way down. No matter what he has on his division a superintendent must show results—right results. If the president, luckily, has risen out of the operating department the superintendent has a chance for his life. But under less favorable circumstances, speaking in the tactful verbiage of the state department,—good night.

Here It Is Again

Writing about preservative treatment of poles in this issue, E. E. Boehne of the International Creosoting & Construction Co., says in the last paragraph something which should have been put at the top of his article. Here it is, for the benefit of those who simply can not resist going into the basement for bargains:

"Price considered alone, the blind worship of the low bid, is suicidal to pole service. One of the outstanding developments in modern pole business has been the substitution of a quality or a service-motive for the price-motive in buying. The trend of the cooperative supplier today is distinctly away from first cost, and toward the more substantial values that frequently are inconsistent with low price."

When you are looking for something cheap usually that is precisely what you get—something cheap. And in considering cheap things it is well to remember the homely but wise reflection: It isn't the first cost; it's the upkeep.

Independence Day

All great days for religion and patriotism have their special significance. For editors and printers the Fourth of July is just another unavoidable burden because it means there will be no type set between Saturday noon and Tuesday morning, when it comes that way on the calendar; and this is true of a good many other holidays. For the old and ailing, Independence Day means at least a week, in many cities, of dreadful noises, ear shocks, headaches, and a longing for the great open spaces and solitude. For the politician it means another opportunity to use up a lot of perfectly delightful atmosphere which might be put to better uses than in circulating the customary flapdoodle the orators have committed to memory through hours of mental strain.

When the Declaration of Independence was signed, in 1776, the act to most Americans meant simply that the signal had been given for war between the colonies and England. A few years later, during the struggle for a stable and democratic government, men looked on the Declaration as of value chiefly as an enunciation of the principles upon which such a government should be founded. The significance of the document to us today is due to neither of these aspects. The Declaration means something to us now because it is an admirable statement of the only terms upon which a really democratic government can be, not only founded, but successfully maintained.

We have learned, in the passing years, that patriotism means something more than the killing of enemies, the repelling of invasions. We know, now, that the men who provide comforts and conveniences for the public, often at a loss, who keep the railroads and the highways, the steamer lanes and the airways, operating efficiently for the world's transportation, who build beautiful cities and villages that we may have peaceful homes, and live in safety, if we observe the traffic signals, are performing work as patriotic because of its great influence upon human happiness, as anything done by armies and navies. Meanwhile, labor, not including editors, may find comfort in the reflection that not until 1933 will July Fourth fall on a Sunday.

The Second In Command

Many a competent understudy, the assistants to, the trainmasters, chief dispatchers, in the railroad world, and others had their chance to make good in June. It was a month of conventions. The presidents had their day in New York and Washington. The mechanical heads, who manage the power that makes things run, gathered for a week in Montreal. The operating force in steam transportation, represented in the American Railroad Superintendents' Association, betook itself to the other side of the continent gaining in numbers as it passed along on its way to a week's deliberations in San Francisco. The accountants, who try to have things running smoothly in a book-keeping way, foregathered at Denver to talk things over, and if losses through theft and damage suits mount to unusual figures blame it to the fact that the chief special agents, that is to say the railroad police, were in solemn and profound conclave also in San Francisco. It was a great month, a month of speeches and papers, and of long reports which tired secretaries read until their throats were sore, in some of the gatherings, despite the fact that they had been printed and distributed, and in some cases read long before the meetings were called to order. Just why some outfits do this passes the undestanding of fairly intelligent persons. The superintendents, of whom there were about 1,000 on the Pacific Coast displayed the most remarkable perspicacity, perhaps, by prohibiting speeches in the convention. That was a great idea.

The Blessings at Home

You have to leave home to get the real measure of the comforts you have had there. Omar Gray, a Missouri editor, has just returned from Switzerland. "The average cost of a railroad berth in Europe is ten dollars," Gray said recently, "and if the train arrives at its destination at 5 o'clock in the morning, passengers must get out. There is no sleeping until 7. You have to visit Europe to appreciate the excellent service given by American railroads."

Value of Locomotive Economy Devices

An interesting report, in these days of economic stress is that presented by one of the committees at the International Fuel Convention recently held in Chicago. The committee, composed of unusually able personnel from the railroad and allied industries, brings out many interesting facts, but the most notable is the data supplied it by the Texas & Pacific. This shows that 15 locomotives equipped with feedwater heaters, superheat for auxiliaries, boosters, rail washers, thermic syphons, limited cut-

off and designed for 250 lbs. working pressure, with enlarged grate area and four-wheel trailer-trucks, compared under the same operating conditions with the performance of 36 locomotives of similar type, designed for a working pressure of 200 lbs. and not equipped with the devices mentioned, reduced fuel consumption 38.4 per cent and increased train loading 20.4 per cent. And still we have some of the O. F. R.'s (old fashioned railroaders) who say we are dolling up the engines today with too much jewelry.

Competition!

It takes a good bit of assurance, in these fast times, for any man to say what transportation will or will not be in the next ten years. Arthur Brisbane has the necessary quality. Several million persons who did not learn how to read until Brisbane burst upon the American public read his daily exudations as gospel. But Arthur Brisbane, like the rest of us, frequently has something in the paper which is killed by another story in the same issue. It happened the other day, tragically. Brisbane told the millions how Samuel Klein with his father was motoring from Chicago to Los Angeles to cut seven hours from the Santa Fe Chief's schedule. Klein was to be in Los Angeles ahead of the Chief, Thursday morning, June 30. But long before that poor Klein was in the morgue. Trying to outdo the railroads at 60 miles an hour, he struck a concrete bridge railing near Council Grove, Kansas, Tuesday morning, June 28.

How foolish, how unnecessary and how unproductive! Even if Klein had reached Los Angeles ahead of the Chief, what would it have meant to anyone except himself? Klein was a successful business man but he went wild over speed. Brisbane talks much about such matters and how the railroads must prepare for competition. But when Brisbane goes anywhere he rides in a railroad train.

An Explanation

In presenting the story on Page 82, in the issue for June, entitled Making Ties Now From Scrap Rail, the author's title, inadvertently, was omitted in the make-up. William Dalton, to whom we are indebted for the article, is connected with the General Electric Co. The company has designed a new type of automatic electric arc welding equipment with which to make these ties.

Human Engineering

Speaking at a dinner given him a short while ago, Charles M. Schwab said to the members of the American Society of Mechanical Engineers, that the next branch of that profession to be heard from in the near future is Human Engineering. Mr. Schwab, like most other men who have risen from humble beginnings, never forgets the human side of things. Business, he says, is full of sentiment. "What we need," says he, "is executives, men who know science and men . . . especially learned in Human Engineering, men who know how to get other men to encourage other men to do their best work. No good work is ever done under criticism."

Do You Need Five Dollars?

What do you imagine will be the prevalent form of transportation in America 50 years from now? Not that it will matter very much to some of us, but what is your prophesy? Transportation will pay $5 for the best letter on this subject—not more than 200 words and get it into the mails by August 15.

This Advice Ought to Be Good

A young engineering student, for some inexplicable reason, has asked us what he is to do to succeed. We falter in replying, not because we dislike the giving of advice but because we lack personal perspective. Russell Sage once said the best way for a young man without friends or influence to begin is to get a position. That ought to be easy, but you'll find a line forming at the right. Second, said the great Sage, the youngster should keep his mouth shut. Third, he should observe, be faithful, make his employer think he would be lost in a fog without him, which isn't always easy to do with employers, should anyone inquire, and finally the young man should be polite.

John D. Rockefeller believes, he says, that the man who starts life with the idea of getting rich will not succeed. He must have a larger ambition, which the editor can not at the moment conceive. Mr. Rockefeller says there is no mystery about business, but we don't believe him. Keep your head clear, he says, and you will come out all right. Maybe so.

The Value of Transportation

In one of the issues of the National Geographic Magazine an account was printed describing a journey across Africa from Cairo to Capetown. The company utilized rail transportation wherever possible, and followed river routes wherever there were facilities, waiting at one time for two days for a boat to arrive and at another time six days, eventually coming to a stretch of country across the interior, 250 miles, where the only means of transportation was native carriers. They engaged 24 of these, each carrying 60 pounds, the journey taking 16 days for 250 miles, the entire party being on foot.

At the conclusion of this journey, each of the carriers was paid the recognized charge of $2.50, and in addition a gratuity of 75 cents, which they considered liberal, making the total compensation

per carrier $3.25, and this included the return journey to their homes.

At first thought this appears to be the cheapest transportation in the world, but reduced to a ton-mile cost, our American measure, each carrier performed on this journey 7.5 tons 1 mile which, divided in the cost of $3.25, gives a charge per ton-mile of 43 1/3 cents.

The average freight charge per ton mile in the United States in 1925 was 1.10 cents. In other words, the cost in the jungles of Africa was nearly 40 times as great per ton-mile as the charge in the United States, and took 16 times as long to make delivery. Counting the round trip, the employes' compensation was 10 cents a day.

The citizens of the United States should be congratulating themselves on the cheap transportation they have, and not discussing it as expensive from any point of view.

The Same Old Hokum

In an article published recently favoring the Mississippi-Warrior River barge lines in competition with railroads, the usual clap-trap is set forth—and the author's name, by the way, is Clapp. "The government's investment in the line," says the ingenious writer, "amounts to 14 million dollars. Last year it made a net income of $220,000 after all expenses, including a depreciation allowance of $350,000. The Mississippi service alone earned a net of $520,000. It must carry the unprofitable Warrior (Alabama) line, which lost $300,000. Out of earnings, including depreciation reserve, last year the corporation paid for ten new steel barges of 2000 tons capacity each."

All these writers overlook or purposely ignore the important fact that the government barge lines, financed with money taken from the people, including the railroads, in the form of taxes, pay no interest on their capital, as railroads must do, and are in direct competition with the railroads whose rates the same government can and does regulate. The operation of these barge lines, and the Panama Canal also, has been a continual drain upon the people, but it does serve as an outstanding example of the peculiarly childlike and bland inadequacies of practically every big business undertaking in which the government engages. History is filled with such stuff.

Why Not the Oldest Inhabitant?

Two of the four new cars which were ordered recently for use on the Evansville & Princeton, Ind., traction lines have recently been put in service by the Southern Indiana Gas & Electric Co., Evansville, Ind. The cars, of the one-man type, are named after prominent men who figured in the history of Gibson County, in which the city of Princeton is situated. The "John Stevens" is named for the first settler of Gibson County, who settled there early in 1789, after serving a period of service in the Revolutionary War. The "William Prince" bears the name of the man for whom the city of Princeton was named. Still another car, styled "Aaron Le Grange," is in honor of the first settler in the town of Fort Branch, which formerly was called Le Grange, and the fourth car, "Henry Haub," is in remembrance of the first man who settled in the town of Haubstadt, which is one of the important stops on the Evansville and Princeton traction line.

Queer things are happening nowdays in the railroad world. One great company paints its locomotives asparagus green and names them for dead and gone Presidents of the United States. Another runs a broad gold band clear around its engines and fenders. Still another puts the engineer's name on the engine he drives. The Pullman Co. adopts a new set of names for its sleepers, beginning with John Smith. Interesting.

The Chicago & North Western-Union Pacific Systems have just put on a new train between Chicago and Denver to be named the Columbine in honor of Colorado's state flower. The Milwaukee should now announce a train for St. Paul, to be called the Gold Medal, Minnesota's state flour.

A Matter of Emotion, Perhaps

We live in a world of thrills, and all of us are affected differently, in one way or another by the things we see. Reporters, being only human like the rest of us, are subject to about the same emotions. This may account for the astonishing variety in stories telegraphed to this country when Chamberlin flew to Berlin and nearby points. Some morning papers, accepting as true the word of their correspondents, assured the public that the flyer and his passenger had landed in Berlin, while others, more careful, perhaps, or just luckier, said Chamberlin had been forced down for fuel, short of his mark. One correspondent described the plane as "the little Columbia," while another always called it "the giant Bellanca." Both terms had their fascination, but left the readers in doubt. One reporter said Lindbergh's first words upon arriving at Le Bourget flying field were, "Give me a drink," and another said he opened the door of the cabin and informed the world that his name was Lindbergh. One paper said he never drank a drop of anything, and another described him as replying, when questioned about what he had done with the champagne handed him, "What would you have done?" Ho Hum!

Don't waste time and heat yourself into a perspiration arguing with men for whose opinion you have no respect.

What's the News in Washington?

Dull Days at the Capital

By W. E. Hopkins

A PERIOD of quietude has settled over Washington since the departure of President Coolidge to his summer home in the Black Hills. With his departure, there also was a general exodus of cabinet members, as well as members of both houses of congress who happened to be lingering around the national capitol.

Two hearings of prime interest were held during June by the Interstate Commerce Commission, but no indication has been given as to whether a final opinion in either might be expected before that body adjourns the last of July for its usual recess over August.

One of these hearings was that in which testimony was presented on behalf of the Chesapeake & Ohio in support of its application for authority to acquire stock control of the Erie, and the Pere Marquette railways, and to issue $59,502,000 of additional common stock. The other hearing was in connection with the socalled Wheeling & Lake Erie interlocking directorate case in which officers and directors of the Baltimore & Ohio, the New York Central Lines and the Nickel Plate are seeking authority to serve also as directors of the Wheeling company in which each has recently acquired a seventeen per cent stock interest. Rumors have been current in New York and Washington that at least the former case might be decided within the very near future but such rumors so far have not been confirmed.

The commission is grinding out many miscellaneous orders in an effort, apparently, to do everything possible to clarify its docket

to as great an extent as possible. A final value of $1,038,265,910 for rate making purposes was placed in June by the Interstate Commerce Commission on the common carrier property of the New York Central. This valuation is as of June 30, 1917, and includes $306,465,910 for leased lines.

Final value of owned carrier property was placed by the commission at $737,401,514. The company also owned carrier property valued at $5,601,514 which it did not use but leased to other companies. The final value for the wholly owned and used property was $731,800,000. The commission's report does not, however, include all property of the system known as the New York Central Lines, as several lines, such as the Cleveland, Cincinnati, Chicago & St. Louis, and the Michigan Central, controlled by stock ownership, are included in separate reports.

Figures just made public by the United States treasury show that the railroads of this country, indebted to the government from the period of government control and post war guarantees, have paid $89,316,810 in principal and interest into the government treasury in the fiscal year which ended on June 30. The railroads still owe the government approximately $230,484,000. Of the amounts paid, $68,628,774 was on principal of the obligations, and the remainder interest on securities held.

The present high level of efficiency and economy with which the railroads are being operated is reflected in purchases of freight cars and locomotives which continue, this year, to run below those for 1926 and 1925.

Freight cars placed in service in the first five months, this year, totaled 30,251, according to reports just filed by the carriers with the car service division of the American Railway Association. This was a decrease of 12,049 cars compared with the number placed in service during the corresponding period last year. Of the total number placed in service in the first five months this year, the railroads installed in May 1,934 coal cars, 4,889 box cars, and 299 refrigerator cars.

The railroads on June 1, this year, had 23,949 freight cars on order compared with 44,628 on the same date last year.

Locomotives placed in service in the first five months of 1927 totaled 782 of which 148 were in-

stalled in May. In the first five months last year, the railroads placed in service 933 locomotives. Locomotives on order on June 1, this year, numbered 291 compared with 612 on June 1 last year.

These figures as to freight cars and locomotives include new and leased equipment.

Freight traffic on the railroads of the United States continues to run considerably ahead of the corresponding periods in the two previous years but due to the Mississippi River floods, and apparently a seasonal decline in general business conditions, there has been something of a slackening in the freight traffic in recent weeks. For the first 25 weeks in 1927, reports show 24,308,520 freight cars loaded with revenue freight compared with 23,953,789 during the same period last year and 23,335,-317 in 1925. In recent weeks, however, revenue freight loadings have fallen below the corresponding weeks, last year, although they continue to exceed those weeks in 1925.

The high standard of maintenance for equipment continues, however, and reports received by the car service division of the American Railway Association show that the roads in the middle west are in better condition to meet the expected heavy crop movement, this year, than they have ever been.

The desirability of bringing about as great stability of employment on the railroads of this country as earnings, traffic and climatic conditions permit, is recognized in a report just submitted to the member roads of the Association of Railway Executives by a special committee appointed in 1924 by the association to study that subject. The members of the special committee were: Chairman, Daniel Willard, president of the Baltimore & Ohio; L. W. Baldwin, president of the Missouri Pacific; H. E. Byram, receiver Chicago, Milwaukee & St. Paul; W. R. Cole, president, Louisville & Nashville; P. E. Crowley, president, New York Central Lines; C. R. Gray, president, Union Pacific System; L. F. Loree, president of the Delaware & Hudson; E. J. Pearson, president of the New York, New Haven & Hartford, and Samuel Rea, president, retired, of the Pennsylvania Railroad.

"Your committee," said the report, "is convinced that stability of employment invariably is reflected in more efficient and economical operations, and it recommends that the carriers continue to give sympathetic and constructive consideration to this important problem not only as a matter of fairness to the employes, but also because such a policy tends to promote efficiency and economy in operation.

This is the Private Car of Kemal Pasha, President of the Young Turks' Republic. A Steel Car With Bath Room and Many Other Comforts

"It is the opinion of your committee that there are at least three controlling factors in connection with railroad employment; the lack of stability in railway income, lack of stability in traffic, and climatic conditions. It is believed stability in traffic has been promoted to a very considerable degree by the more dependable character of the service the railroads have been able to render for the last two or three years. With greater stability of traffic has come at the same time a greater stability in earnings and more satisfactory net returns, the railroads being able to handle a uniform flow of business with greater economy than would be the case if the same aggregate amount of business during a twelve-month period fluctuated greatly in volume from month to month.

"With the foregoing in mind, your committee is convinced in order to bring about and maintain as great a degree of stabilization in labor as may be practicable, it is most important there should be a sufficiently liberal margin between operating revenues and operating expenses, so the carriers may be able:

a. To initiate broader policies particularly with reference to their maintenance program, and adopt plans for spreading or distributing such work throughout the year regardless of current monthly revenues.

b. To eliminate so far as possible temporary or emergency expenditures.

"It is clear the most influential, single factor relating to the stability of labor is the question of net earnings by the carriers. The railway managers as a whole have shown a real desire to bring about the greatest possible stabilization of employment, but however their sympathies may run, their action necessarily will be governed to a very considerable degree by the financial condition of their company.

"Information which has come to your committee during its study of the problem suggests the desirability of a more flexible day than exists in many places at present, as an element to be considered in the stabilization of labor. While there seems to be a general tendency at present to recognize the eight-hour day in most lines of employment, much is to be said in favor of a certain elasticity in the number of hours to be worked. If the day could be increased from eight to nine and even ten hours in times of business activity, and be reduced to eight hours in times when business is less active, such a policy would enable the carriers to employ a more uniform force throughout the year, and avoid the necessity of laying off or furloughing large numbers of men in times of business recession."

The Field of the Motor Bus

Its Place in Transportation

By A. J. Brosseau

President Mack Trucks, Inc.

ALMOST from the day, not so long ago, when the automobile became a practical method of transportation, the public has wanted some form of vehicle which would make generally available the benefits of the private automobile.

The jitney was the first effort to fill this demand and the stir it caused served only to emphasize the public desire for motor transportation. Out of it grew the first buses, crude bodies mounted on motor truck chassis, and from these came the present day "all bus" vehicle.

What the bus of the future will look like, no one knows. But, just as we have seen rail and other mechanical equipment improve, so we may confidently expect that the bus will grow in efficiency as experience points the way to new and better designs.

The problem we face is that of finding the place of the bus in the transportation field, and how it can best be adapted to the uses of the public.

If we glance at the statistics of bus use we shall find that of the 80,000 vehicles now in service, 32,778 are employed in transporting children back and forth from school. This business is nearly all in the hands of so called independent operators. As to the rail carriers, there are indications on every side that they should extend the use of the bus in urban operations. Two of the most promising fields are, the marginal area of thin traffic in every city, in which rail car services are performed at a loss, and the de luxe or express service from these districts to downtown areas.

In these fields the wideawake and forward looking rail carrier can employ the bus to his advantage and give his customers better service at lower cost, than he can by using the trolley. If the rail carrier does not avail himself of these opportunities, the field is open to the so called independent operator, and I predict that it will be some time before the independent bus operator passes out of the picture in the urban field.

A. J. Brosseau.

In the so called urban common carrier field the independent bus operators now have some 5000 vehicles in service; electric railways 5,000, and steam lines 756. Incidentally, all these uses show a rapid growth during the short period of their development.

I mention the numbers operated by the different groups, because it is when the bus comes into competition with the other agencies that the discussion of its place in transportation becomes of the greatest interest to the public.

I place the urban situation first, because, while this field has not yet been fully developed, progress has been so rapid that we can speak definitely about some aspects of it. Out of the experience in this use, too, we are likely to find facts which are of value in discussing the rural service.

The place of rail lines in handling mass transportation in congested centers appears, at the moment, to be secure from an economic point of view.

At what point of thinning density the bus begins to give a superior all-round service upon an economical and profitable basis, is a question, however, upon which there is not yet conclusive evidence..

We know the vehicle has been substituted for entire trolley systems in 65 towns and cities, all of them under 100,000 population. Whether the bus, in its present state of development, can replace the trolley in cities of larger size must be decided by the experience of the rail operators with buses.

This experience, to be worth while, must be based on facts—all the facts. Experience to prove buses are not so efficient or desirable as the trolleys can easily be upheld by anyone determined to prove the superiority of the trolley by overlooking some of the facts. On the other hand, the case of the bus must be proved by facts—all the facts. The time has come when both trolley and bus must stand or fall on their respective merits.

Eventually, all street railway

—Address delivered before bus division, American Automobile Association, at Ritz-Carlton Hotel, New York, June 15, in its first session.

Loading Containers on Trucks, Boston & Maine R. R.

companies come to the point where new equipment has to be purchased, new rails and pavement installed, and power houses renovated. When this happens they must decide whether it is advisable to substitute buses for rail operations.

Here is a place where your organization, with its impartial membership, may well make studies of value to all transportation groups alike, and ultimately to the public.

When the bus first appeared in the rural field, there was a common impression among rail operators it was destined to make serious inroads upon their passenger business. Events of the past year, and particularly the investigation of the Interstate Commerce Commission have done much to clarify this situation and bring out the facts. We have only to read the testimony of such high railroad officials as P. S. Eustice of the Burlington, F. A. Wadleigh of the Denver & Rio Grande, F. A. Coley, New York, New Haven & Hartford, and Lewis Saunders, Gainsville & Northwestern, to appreciate it was the private automobile, not the bus, which was responsible for nearly all railroad passenger business losses.

It would be interesting to learn how much of the business lost by the railroads and trolleys, because of private automobiles, might be regained by bus operations. I am convinced the greater part of this lost business can be regained by many rail lines through the bus without further loss to their revenues.

R. J. Littlefield, of the Boston & Maine, says it costs from $1.17 to $2.02 a mile to operate steam trains while buses cost from 26 to 30 cents a mile. A recapitulation of the Boston & Maine bus operation is given in the June issue of "Bus Transportation." Briefly stated, the facts are as follows:

Complete and substitution in part for 92,653 steam train miles with operating expenses of $113,672 was effected with 251,843 bus miles with operating expenses of $65,972, or, as Mr. Littlefield says, "the saving to the Boston & Maine is the difference in cost of operation."

Incomplete data also is given for complete and substitution in part

Putting Containers on Flat Cars.

of bus for electric railways. The only operation for which comparable figures are given is the Portsmouth City routes where a deficit (average) of $20,000 is reduced to $1,714.

The experience of the 61 railroads now operating motor buses doubtless would tell a similar story of savings effected by the substitution of the bus for the unprofitable branch line rail operation. Of course, not all railroad operations lend themselves so well as does the Boston & Maine to the substitution of buses for rail operations, but when millions of dollars of potential savings are involved railroad management may be expected to be alert to its opportunity.

One frequently hears the complaint from rail operators that they are compelled to give service to some localities at a loss. This may have been necessary in the past, but many of these communities are no longer dependent upon the railroad for transportation. I believe the time has come when public regulatory bodies should give serious thought to this fact, and consider the substitution of bus for rail service, when it is apparent that a change would be in the interest of the general public which "pays the freight."

I believe as railroad men give more and more time to the study of savings in costs to be effected by motor transportation, they will turn increasingly to the use of the bus for local operations. In many instances this would mean competition with, or acquisition of, or contract relations with existing independent bus lines. But whatever the method, there will be an expansion of bus services by rail operators, who will then, without extra cost to them, be enabled to give the public more frequent and satisfactory service.

Before reviewing the field of the independent operator in rural service, I wish to call to your attention the findings of H. R. Trumbower, of the bureau of public roads, who, in his investigations, finds that in

Bus Service Auxiliary to An Electric Line is Well Patronized.

Pickwick Stages, Open Top Observation Coach.

eight widely separated states, 582 out of 702 common carrier operations, or 82½ per cent of the total, were on routes of 35 miles or less. This would seem to prove so far as the railroads are concerned the bus is not so great a factor in long distance service as some have supposed it to be.

In the November, 1926, issue of "Public Roads," Frank Page, chairman of the North Carolina highway commission, presented some very pertinent and interesting data on state highway development in North Carolina, and the results coming from the program of intensive road building. He refers to the fact that parts of the state formerly were inaccessible by highway and reached with difficulty by rail. These "Lost Provinces" have been regained by the state by means of highways, the passenger car and the bus. In part he says:

"Some local train service has been reduced, yet in a survey of passengers carried by bus over a seven day period, paralled to a rail line with excellent through service over 90 miles, the corporation commission found that the buses carried only 234 through passengers out of a total of 6,115 handled between terminals in that period.

"Many of our rail connections have been circuitous, and the automobile and bus were substituted immediately the highways permitted. For example, from Charlotte to Asheville, 120 miles by an improved road completed in 1923. To reach Asheville by railroad from Charlotte one must go through Georgia and South Carolina, via Spartanburg, S. C., 240 miles.

A Compact Kitchen in a Motor Coach.

"Unquestionably the passenger car and improved highways have greatly stimulated the traveling habit. Many persons who formerly traveled by local trains now have their own cars. Many who have tasted travel in their own cars try the longer distances by rail. Unquestionably most of the rail loss of passenger business has been in local business which has gone to the private automobile. We may well give attention to the question of substituting the bus for the local passenger train. In many cases this would relieve such lines of undue burdens in providing service for the small percentage of such business remaining."

I believe there is a large field for the independent bus operator in rural territory. By rural territory I mean outside of cities, large and small.

If the rail lines, steam or electric, wholeheartedly adopt the bus, I am confident its operation will be confined very largely to the paralleling of their rails. In some instances the bus will replace local trains. In other instances, it will offer a different character of serv-

The Pickwick Observation Coach.

ice to regain the business lost to the private automobile.

Regardless of the extent to which steam or trolley rail lines go into the bus business, there will remain for the independent bus operator a large field in which he can develop a much needed service to the public. It must be remembered that the greater percentage of the bus movement is not competitive. J. Walter Drake, assistant secretary of commerce, has pointed out the bus has placed in touch with the railroads some 45,000 communities not on rail lines.

I believe these independent bus operations will be in the hands of responsible owners operating large or small fleets as local conditions justify.

The troublesome question of regulation is as yet unsolved. I am not an authority on the subject, but permit me to point out some elements which I consider fundamental.

One of the chief virtues of the bus is its mobility. It does not run on rails, but it can go wherever there is an improved road. It is not costly to stop, hence it can pick up passengers at any point. Rates per mile should not be uniform unless road and other conditions are comparable. Regulation should not be based on rail or bus practice of today. Elaborate systems, such as apply to rail lines, are not needed. Disregard all or part of these factors and you will retard bus development and so hamper it as to deny the public the benefit of its use.

I emphasize these points because in the first stages of bus regulation precisely these things were attempted. Legislators, in many cases, did not take into consideration the fact that the bus performs an entirely different service from that of the rail line and should be regulated as a bus—not as a rail vehicle. Bus regulation, of the railroad type, is not only restricted, but it is contrary to the public interest. There are those who believe this sort of punitive regulation was, in the past, prompted by hostile rail interests. Regardless of where the responsibility lies, I am sure rail lines, now operating buses, will not approve it.

Bus development can come only as we have regulation based upon the following principles:

Varying standards of rates.

Liberal policies with respect to development of new lines.

Sympathetic cooperation on the part of regulating bodies with respect to flexible schedules, so adjusted as to give necessary service with a minimum of waste.

Her Grip Holds a Few Dresses, Shoes, and Things for the Modern Girl.

Protection of existing lines of one type against interlopers of the same type, so long as public service requirements are met.

In short, regulation which considers first the needs and desires of the public, and second, the interests of the carriers. I do not say there should be no regulation. But I do believe regulation should be based upon the differences, as well as the similarities, which exist between rail and highway operation.

I am not one of those who believes if a rail carrier has adequate physical facilities to carry passengers over a given route, the public should be denied the use of the bus if it wants and is willing to pay for that form of transportation. In such instances regulating bodies should determine to what extent the rail carriers may add or substitute bus for rail service, or grant franchises to an independent operator. The carrier, whether rail or highway, should be protected against destructive and uneconomic compeition so long as it properly serves the public.

The bus, like any other highway unit, should pay a fair charge for its use of the public highway. It is doing so today as government figures prove. Unfair and punitive taxation levied against the bus will be reflected in increased cost to the consumer of highway transportation.

One Small Grip Is Enough Nowadays

The transportation of baggage has always been a most important item to the traveler, and the amount carried seems to increase in proportion to the advance of civilization. The original allowance of 14 pounds is found to be increased to 400 when ladies start for fashionable summer resorts, says the book "American Railways," printed in 1888.

America has been much more liberal than other countries to the traveler in this particular.

The earlier method, of allowing each passenger to pick out his own baggage at his point of destination and carry it off, resulted in a lack of accountability which led to much confusion, frequent losses, and heavy claims upon the companies in consequence. Necessity, as usual, gave birth to invention, and the difficulty was at last solved by the introduction of the system known as "checking."

Fewer Passengers But More Freight

Competition That Creates Traffic

By P. E. Crowley

WE NO longer refer to the "automobile **versus** the railroad," in New York Central circles. We say the "automobile **and** the railroad." While it is true that railroads could continue to function without the aid of automobiles, no one can be so blind as to fail to see that the proper co-ordination of motor vehicle and steam railroad service will make the railroads more efficient instruments of commerce. On the other hand, it must be plain that the automobile industry is in great measure dependent on the railroads. Even if it were possible for the millions of automobiles to perform more than a small fraction of the work now done by the steam railroads, the manufacture of these motor carriers on anything like the present scale would be an impossibility without the aid of freight trains feeding the factories with raw materials and fuel from far-away sources of production.

P. & A. Photo
President Crowley of the New York Central

In the course of a year the railroads move hundreds of thousands of trainloads of raw materials, fuel and finished products to and from the automobile factories. And, in addition, they carry to these industrial centers other thousands of trainloads of food and other necessities of life, without which these cities could not exist.

Our railroads have come to be such a commonplace of our daily life that we seldom realize how utterly dependent we are on these steel highways that cover the whole country like a network. We might get along, as we did for many years, without telephones, electric lights, street cars, automobiles and other conveniences that have come into use within the memory of many of us—but without the railroads, these modern beasts of burden, life as we know it today would be impossible. We would still be a primitive people, huddled along the seacoasts and waterways, with great stretches of wilderness where now are rich industrial and agricultural areas supporting many millions of people.

But the rapid development of motor vehicle transportation on the public highways is naturally having a very marked effect on steam railroad transportation.

That there is growing competion between railroads and automobiles in the transport of both freight and passengers is not to be denied. How could there escape being some competition when, for every railroad passenger car in the country there are 500 passenger automobiles; and when there are as many motor trucks as there are freight cars? And, I might add, when we have only 250,000 miles of railways as compared with 3,000,000 miles of public highways, maintained out of public taxes, of which the railroads, by the way, pay $360,000,000 a year.

The American people have become a nation of travelers such as the world has never before seen. The farmer, who formerly seldom journeyed beyond the nearby market town, now considers he is not getting good use of his automobile if he does not cover several thousand miles a year. Workers in the industrial cities spend their summer week-ends exploring the country highways. The horizons of all our people are being broadened. Sectional barriers are disappearing.

And while the volume of travel has been enormously increased, there has been, it is true, a temporary decline in the use of steam railroads, especially for short-distance journeys. I say temporary, because I am convinced, from our own experience on the New York Central, that the automobile, by stimulating the desire to travel, and thus greatly enlarging the market for travel service of all kinds, eventually must produce more railroad travel, especially long-distance travel.

But it is a fact that in the past six years there has been a marked decline in the use of railways for travel—a decline that has seriously affected the passenger earnings of some of the carriers. Thirty years ago the average American traveled 200 miles a year on the railroads. At the peak of the post-war boom in 1919 and 1920 this figure had mounted to 445 miles per capita. But since then, in the short period of six years, there has been a sharp drop of

about 30 per cent, and the per capita figure in 1925 was back to 312 miles, or about where it was twenty years ago. As a result of this decline in the use of railway passenger trains by the average American, the railroads of the country, as a whole, in spite of the growth in population, are performing no greater volume of passenger business than they were in 1914.

Since 1914, it is to be noted, some 20,000,000 motor vehicles have been brought into use. Measured in passenger miles, they are performing a much greater volume of passenger service than the railroads. It is estimated by our friends in the automobile industry that motor vehicles this year will produce close to 100 billion passenger-miles of transportation, as compared with 36 billion on railroad trains.

If that were the whole picture, the railroad man might have reason for serious concern. But what the larger railroad systems have been losing in short-haul passenger business they are making up in other services. On the New York Central lines, for example, the growth of long-distance travel between the great commercial and manufacturing centers has been accelerated since the introduction of the automobile.

The Twentieth Century Limited, which next year will celebrate its twenty-fifth anniversary, and this is about as old as the automobile industry, is now carrying six times as many passengers as it did when the twenty-hour service was established between Chicago and New York.

Passenger traffic, however, represents only about one-quarter of the business of the railroads. When we examine the freight traffic returns we find that the volume of freight service is now four times what it was thirty years ago, and double what it was twenty years ago. It has increased 50 per cent since 1914, during this same period which has seen the putting into use of 20,000,000 motor vehicles.

The American railroads are carrying today the greatest volume of traffic in their history, and no small part of this record traffic is due to the demands of the automobile and its allied industries. What they have lost to the automobile in short-haul passenger business they have much more than made up in freight service for the industry.

The automobile industry could not have developed with such amazing rapidity to its present magnitude without the transportation resources of these railroads to draw upon.

Electric Railway Men in Session

A joint session of all committees in the California Electric Railway Association met at the Mayfair Hotel, Los Angeles, June 20 and 21. These committees included representatives from the forces of the superintendents' department, engineering, accounting, claims, public relations, purchasing and stores. Two of the important addresses of the first day's session, those by F. A. Miller of the San Francisco & Sacramento R. R. Co. on "Roller Bearings as Applied to Electric Railway Equipment," and that by C. D. Stewart, vice president and district engineer for the Westinghouse Air Brake Co. on "Variable Load Brakes" are printed elsewhere in this issue. J. H. Handlon, claim agent of the Market Street Railway Co., San Francisco, spoke on "Cooperation Between Transportation and Claim Departments in Accident Prevention." Mr. Handlon described the important and very welcome improvement in the manner in which claims, and the investigation into their merits, are handled nowdays in contrast with the procedure followed 20 or 30 years ago. "The transportation official," Mr. Handlon said, "knows that many accidents are avoidable, and that they may be reduced by intelligent, careful selection of platform men, the thorough training and supervising of these men, the establishing of safety rules, the adoption of safety devices and the rigid and just enforcement of discipline: Said he:

"The claim agent knows student trainmen are forearmed when they are forewarned, that if they are shown how accidents occur, and are taught what can be done to avoid them; that if every trainman is told about the danger points on the company's system, and kept informed of what accidents occur there, and the kind of accidents that happen at those locations; that if accidents that merit investigation are investigated with a view of determining the responsibility and fixing the guilt of that person, preliminary to the enforcement of discipline by the operating department, then accidents can be reduced. He also knows that it pays to deal impartially and fairly with claimants and that most claimants are honest, well intentioned persons.

"What can the transportation department do to eliminate accidents that is not now being done; and the claims department, having in its possession a mass of testimony revealing the causes of accidents and an accumulation of statistical records or accidents by lines; locations; kinds of accidents; accidents to various types of equipment, what can it do to further aid the transportation department in its safety work? Is every transportation department connected with this association continually and systematically observing the actions of each of its employes while on duty, with a view of detecting and eliminating what might be accident-breeding habits on their part? Is every transportation department regularly examining the accident records of all trainmen to note not only what accidents they have been involved in, but the kind and causes of those accidents and the cost of each man to the company from an accident standpoint?"

Making Big Ones Out of Little Ones

A Plea for Section 15A

By Bird M. Robinson

Prest. Amn. Short Line R. R. Ass'n.

DURING the last hundred years there has been built in the United States more than 260,000 miles of railroad. This is approximately 40 per cent of all the railroads in the world. In addition to that great mileage, our railroads are in most respects the strongest, best, and most efficient of any in the world. Beyond doubt, they have been the one thing that has enabled us to develop our great country, and make it the richest and best on earth.

During the many years in which they were developing, opening new territories, and rendering unequalled service, these railroads have been limited, restricted, harrassed and controlled more than any other enterprise, and they are now regulated and controlled, even to some of the most minor details. Notwithstanding all this they have grown and improved. The public is proud of our railroads, and I join in that pride. But I wish to bring to your attention one very important thing, something the public seems to have forgotten, if it ever knew about it:

The short line railroads, of which more than 7,000 have been constructed, have been the real developers, so far as transportation is concerned. As a rule they were the pioneers. Their builders endured the hardships and handicaps inherent in such development work. Beyond doubt, they did more to make a wonderful development of this country possible than any other agency, and they are entitled to the credit of having made our large and prosperous systems possible.

It may surprise you to know that the large railroad systems of this country are composed of more than 6,000 short lines. The Pennsylvania System is composed of more than 650 short lines; the

Bird M. Robinson

New York Central of more than 400. In your own section, the Missouri Pacific is made up of more than 200 short lines, the Santa Fe approximately 175, the Burlington about 250. I could, if time permitted, name approximately the number of short lines that have gone to make up all of the other systems, but suffice it to say there is not a single large system in the United States that was constructed as such; every one has absorbed a greater or less number of short lines.

While benefiting the country as a whole to an immeasurable extent, the short lines have suffered, somewhat in proportion to the benefits conferred upon others. The great majority of the more than 6,000 of such roads that now make up our transportation system were forced through bankruptcy and were absorbed by larger roads at the expense of the original investors.

While there is no well defined description of a short line railroad, we still have approximately 700 roads in all of the states except Nebraska that can be so classed, and the public is vitally interested in the preservation and the welfare of the very great majority of them.

The disastrous experience of the builders and owners of short lines situated as they were, remotely one from the other, finally forced upon them the necessity of organizing for self-preservation. The American Short Line Railroad Association, the national organization of that class of roads, consisting of 495 companies as members, is the result. It was formed in September, 1913, and I have had the honor of directing its work, as its president, for the last 12 years. That association is based upon the one broad, sound and fundamental principle, that the public interest in transportation, as in many other things, is paramount; and that there is not, and cannot be any conflict between the true interests of the public and its transportation carriers.

The adoption of that fundamental principle was prompted by the knowledge upon our part, born of bitter and distressing experience, that both the public and the carriers have suffered seriously as the result of the many and almost con-

—An address before the Traffic Club of Oklahoma City.

tinuous contests waged between them during which their mutual interests were either ignored or denied. During all of the contests between the public and the carriers, there has been an utter failure upon the part of both to recognize that it was not possible for one to be prosperous at the expense of the other.

Every act of my association has been based upon the confident belief that when the public and the carriers realize that their true interests are inseparable it will be possible to harmonize existing conflicts, ascertain and fix the respective rights and duties of each, and thereby promote the interest and welfare of all.

The one paramount object of the association is to aid the public to understand the difficulties involved in its transportation problems with respect to the rail carriers, especially so as to enable it, not only to retain all the short and weak railroads, but to have them improved and developed so as to render prompt and efficient services.

While we were engaged in that very laudable work, the war came on, and the large roads were taken over by the railroad administration. But a great majority of the short and weak roads were excluded, notwithstanding the Federal Control Act definitely provided that they should be included. The administration went so far in its operation of the larger roads as to prevent excluded roads from obtaining necessary equipment, supplies, and even funds with which to conduct their business; and but for the fight made by the association, a very considerable number of such roads would have been destroyed.

It is almost the unanimous opinion that the services rendered by the government when in charge of the roads were unsatisfactory, but the public does not know that during that time certain problems affecting the carriers were accentuated to the extent that it is now imperative that changes be made or disaster will overcome many of the existing lines, and the public will be deprived of that part of its present transportation facilities.

The consolidation of the large number of short lines into our present systems has resulted in much good for those included, and for the public, but conditions have been thereby created that have gradually but certainly made it more and more difficult for other of the roads to exist; it is not possible to make rates in a given territory in which there are both strong and weak roads that will not produce unfair and detrimental results. It is fundamental that the various roads are entitled to receive the cost of their service. It is equally fundamental that a main line transporting not only the traffic originating thereon, but that originating on connecting or contiguous short and weak lines, can render service at a lower rate per ton mile than can the short and weak line with less dense traffic.

These rates are now determined by the various governmental commissions, and are always placed upon a level intended to be compensatory for the strong line that can handle its dense traffic on a low cost basis; this for the reason they are not willing to permit such lines to earn too much. The result is the weaker line is not permitted to have adequate rates, hence the tendency is for it to become weaker. It is not possible to make in any given territory low rates for the strong line and high rates for the weak line without driving the business from the weak to the strong, and thus accentuating the difficulty. Another result of that condition is that the public is prevented from having the benefit of rates that would be more equitable for all.

Congress, when considering the Transportation Act, recognized existing conditions so far as the strong, short and weak lines were concerned, and it determined that the only possible, final solution was to provide for the consolidation of all of the railroads into a limited number of competitive systems. It directed the Interstate Commerce Commission to make a study of that problem, and to adopt plans for the consolidation of all the roads. It also provided that the commission should be authorized after it had adopted its plans, to approve the consolidation of the roads. The commission announced a tentative plan, providing for 19 systems, but has since advised congress it finds it impracticable to adopt final plans, and therefore recommends additional legislation. Bills for that purpose were introduced in the last congress; hearings were had before the committee, but no action was taken. The probabilities are that the coming congress will enact additional legislation providing more definitely for consolidation.

As the result of our study of the transportation problem, we believe the consolidation of all the railroads, not a part, is not only necessary, but inevitable, and we regard that subject as the most important one now confronting the public with respect to rail carriers.

The present law does not attempt to compel consolidation, We believe there is no constitutional right to force consolidation. On the other hand there is no inherent right in any railroad company to merge or consolidate with any other company, but congress does, unquestionably, have the right to authorize consolidation or mergers upon such terms and conditions as it may prescribe, and if any company or companies are not willing to proceed under authority and limitations thus provided, they may continue as they are in so far as consolidation or mergers are concerned.

Congress attempted to preserve for the public all the existing transportation facilities, pending the consolidation of roads then authorized, and to provide for them in the meantime. Realizing it was impossible to fix rates so that each road would receive a fair return, it provided in Section 15a the commission should place the roads in

Sacramenta Short Line; The Sacramento Valley Limited Meeting Trains at Havens.

groups, fix rates for those groups that would, as nearly as possible, provide a fair return, not exceeding 5¾ per cent on the value of all the roads in such groups, and realizing that some of the roads in such groups would earn more than a fair return, it provided that one half of any amount in excess of 6 per cent should be recaptured by the commission, and held as a special fund to be lent to the short or weak carriers to enable them to improve their transportation facilities.

That provision of the law has been more misunderstood and more extensively misrepresented to the public than any act of congress of which I have any knowledge. It is persistently charged that that provision constitutes a guarantee to the railroads, whereas it is just the reverse. It is a strict limitation upon the amount the roads may receive and retain for their own use. The best evidence it is not a guarantee if such evidence is necessary, is that the great majority of the roads in the country has not at any time since that law was passed earned 6 per cent. Many of them have earned practically nothing. Notwithstanding that fact, no line has ever attempted to recover from any source or from any one any amount under that so-called guarantee.

The facts are that the limitation fixed upon the amount of the earnings was placed there because it was known some of the lines would earn too much under any rate that might be fixed by the commission, even if it be a rate that was confiscatory for many other lines in the same group, and it was intended to help the short and weak lines, pending the time that such roads would go into the consolidated systems.

Congress, in the same section, authorized the Interstate Commerce Commission to divide the joint revenue between the various roads rendering the service, expecting in that way to further equalize the earnings to preserve for the public all lines that were made to suffer because of conditions beyond their control.

There has been a great amount of agitation throughout the country for the repeal of Section 15a, and many intelligent persons are advocating its repeal, overlooking, or disregarding the serious results that would follow, in so far as a large number of short and weak lines are concerned. On the other hand, its repeal would in all probability not inure to the benefit of the public through reduced rates, for the reason that the commission has already, apparently, gone to the extreme limit in reducing rates and our Constitution forbids the fixing of rates that will yield less than a fair return on the value of the properties used for transportation. To further materially reduce rates would mean bankruptcy to a large number of companies now struggling to serve, and continue their existence. Our study of that problem convinces us that the repeal of Section 15a would be seriously detrimental to the public in that it probably would result in abandonment of the theory upon which the Transportation Act is constructed, derange rate structures, weaken credit, retard progress, and probably bankrupt many of the weaker roads.

The desire upon the part of all or practically all of the larger lines or systems, is in favor of consolidation of the roads, but most, if not all of them want to acquire other strong roads or to participate in strong organizations. Judging from our experience, they do not want to include the short or weak roads; in other words, they want to take the cream and leave the skimmed milk.

After becoming the great dom-

Redwood Canyon on the Sacramento Short Line.

inant and controlling factor in the transportation business through the absorption of 6,000 short lines, the big roads have suddenly become afraid of the comparatively small number of remaining roads. The fear expressed is that the owners of such roads will demand exorbitant prices therefor. With a view to meeting that groundless fear, we have, acting for the owners of many of them, offered to permit the Interstate Commerce Commission to fix the value at which they are to be sold.

If all the roads are not consolidated, or if the strong are permitted to consolidate without including the short and weak, the present unequal and harmful conditions will be accentuated, and will result in the loss of thousands of miles of road; in fact, it is commonly said by representatives of the large system that a large amount of existing mileage should be scrapped; and one of the most outstanding executives of the country has testified that approximately 30,000 miles of existing road ought to be scrapped.

That problem may be summarized as follows:

The public is vitally interested not only in maintaining the existing railroads but in having them brought up to and maintained at the best standard, so that it may receive prompt, efficient and adequate service at the lowest cost consistent with the fair return to their owners.

The value of the Transportation Act has been demonstrated by the greatly improved service rendered by the carriers thereunder. That service is by far the best ever rendered here or in any other part of the world, and we should hesitate long and think well before amending or emasculating the act which made this possible.

A School for Executives

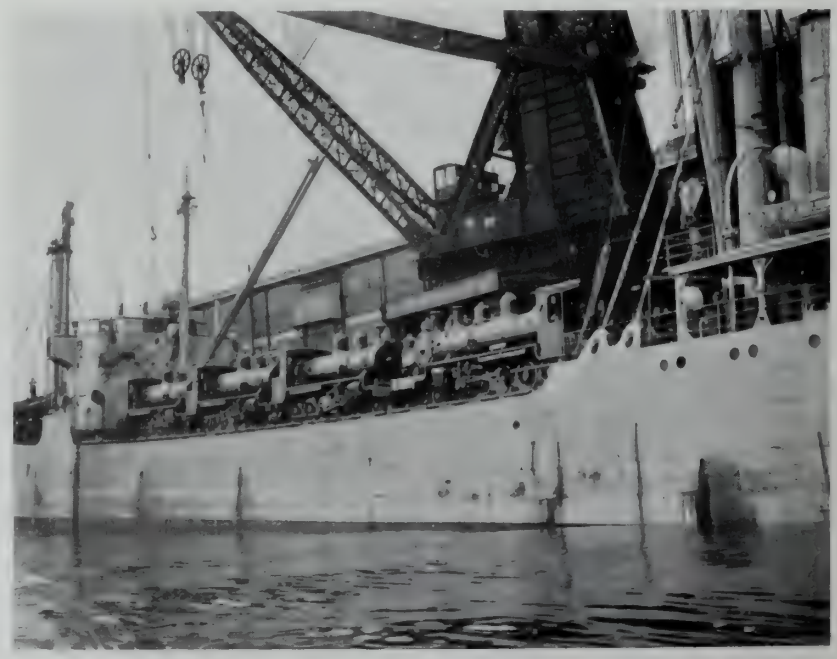
For five years a school for industrial railroad and business executives has held interesting and informative sessions for several days at a time on the Y. M. C. A. conference grounds at Estes Park, Colorado or in other parts of the country. The next session will be held July 18 to 24 inclusive at Estes Park. The particular purpose this year is to study human relations in industry. A dozen or more men well known in business and railroad circles will speak in the several sessions.

The executive's school affords an opportunity for industrial representatives of every rank, and from every phase of industrial life to discuss some of the most important features of business today, human relations. The school is planned and conducted especially for operating executives from president to foreman including such officials as general managers, general superintendents, plant superintendents, personnel directors, welfare directors, employment managers, supervisors, foremen, and employe representatives. Every railroad or industrial employe, or any man whose work gives him contact with industrial or railroad life will be welcomed. The school opens Monday morning, July 18, and continues through Friday evening, July 22. There are five periods for the presentation and discussion of special topics every morning and an open forum in the evening. Afternoons are free for recreation. Those attending are urged to stay through Sunday noon in order to have the entire day of Saturday for longer out-of-door trips and for the inspirational features Sunday morning.

Fifty-eight cities in 18 states were represented in the school attendance last year. Among the railroad men who will speak next month are E. H. McReynolds, assistant to the president of the Missouri Pacific Lines at St. Louis, and George H. Warfel, assistant general manager in charge of safety for the Union Pacific System at Omaha. Edwin W. Peirce, Y. M. C. A. Building, Omaha, is director of the school.

Everybody engaged in a useful occupation is in one way or another a producer, and production means wealth. The real producers are the people who add something to the sum total of human happiness and satisfaction.

All men are born equal; it's what they're equal to later that makes the difference.



—Wide World Photos.

Motor Vessel "Belray" with 26 Locomotives and Tenders for Queensland, Australia, built by Armstrong Whitworth & Co., Newcastle-on-Tyne.

Subsoil Drainage for Roadbeds

An Important Economy

By E. E. King

Professor of Ry. Civil Engineering, University of Illinois

IT IS a well known fact that the presence of large percentages of moisture in a soil tends to break down the structure of that soil, and to make it pliable under pressure. Thus, water accumulating in a railway roadbed is inclined to make it soft and easily deformed under traffic movements. This diminishes the bearing power of the soil under the tie or ballast, and tends to confine the load to a narrower section of roadbed than if the ground were firm. Probably the area of pressure extends little beyond the ends of the ties in such cases, whereas if the soil were firm its adhesive properties would spread the load over a wider section, and thereby decrease the unit bearing pressure. Good, deep ballast will aid in distributing the load over a greater area, but sooner or later much of this material will be driven into the ground, and thereby lose its effectiveness for maintaining drainage and proper surface for ties.

The difficulties encountered with low joints are much exaggerated with an unstable roadbed. These deformations in the surface of the track place a limitation on the speed of trains, and are directly or indirectly responsible for many damaged and broken rails, and for serious derailments. Tamping the track is an item of considerable expense in itself, and interferes to some extent with the movements of trains. A certain amount of this type of maintenance must occur even under the best of conditions, but a large part of the expense can be materially reduced by having a well-drained sub-grade. Even though the tamping be frequent, a track cannot be raised and kept to surface with the best of ballast on a yielding foundation.

The difficulties arising from lack of drainage are increased in colder regions by the action of frost. The uneven distribution of water in the soil causes some places to heave more than others while frozen, producing an unevenness in the surface of the track. Under these conditions about the only methods of maintaining a track surface where the ballast is thin and track uneven is to resort to shims. This heaving leaves the ground open and porous when the frost disappears in the spring, and tends to exaggerate the unstable conditions of the roadbed. Center-binding of the track is increased by high percentages of moisture in the subgrade. This has a tendency to produce a rough-riding track, and if the conditions are extreme, may result in the breaking of rails

The Olympian, C. M. & St. P. Fast Train in A Mountain Region Requiring Roadbed Carefully Drained.

and of the smallest and weakest ties.

In many cases the drainage of the subgrade will prolong the life of the ties against decay and mechanical wear. Decay, as we all know, is caused by a fungous growth that dissolves certain elements in the structure of the wood, and which among other things requires a certain percent of moisture for its propagation and development. In the case of ties, it is most active when the air is warm, and when there is the greatest amount of moisture in the wood. A tie that contains a high percentage of moisture cannot resist mechanical wear as well as one that is dry. The continual hammering the tie gets under severe service conditions has a tendency to cut it and break down its structure more quickly when wet than when dry. It is not possible to stop entirely the capillary action of the water from coming up out of the ground, and thereby completely eliminate these difficulties even with the aid of a reasonable layer of ballast; but proper subdrainage affords a substantial relief.

In these days of heavy rolling equipment and high-speed trains, it behooves the railways to have their track in the best possible condition at all times to provide for economy in operation. In many cases the subsoil drainage problems have increased with the introduction of heavier motive power. The soil has been compressed under these heavy loads forming depressions under the track that tend to hold water on account of the depression itself, and also on account of the increased compactness of the soil. The difficulties that arise on account of these pockets can be eliminated only by proper methods of subsoil drainage.

Tonnage on light grade lines is much more sensitive to changes in train resistance than it is on heavy grade lines, for on the light grade line the train resistance constitutes a much larger percentage of the total resistance a locomotive has to overcome than it does on a heavy grade line. It is a well established fact that the condition of the roadbed is one of the fundamental factors that must enter into consideration in figuring the resistance of the moving train. If the surface of the rail is uneven, these irregularities in track produce a swaying movement in the rolling equipment that tends to cause the drivers of the locomotive to slip, and also to increase the amount of train resistance. Even under the best of track conditions there exists a wave of rail and track deformation just in front of the wheels of the moving train. Within certain limits this increases with the softness of the subsoil, and also adds to the train resistance. In the case of an unstable subgrade this condition is much exaggerated and decreases the load an engine can pull.

An example will serve to illustrate the influence that a slight variation in train resistance has on tonnage rating. Assume that on a 0.3 per cent grade where the grade resistance is 6 lb. a ton the train resistance is increased from 4.5 lb. to say 5.0 lb. a ton on account of the condition of the roadbed. In the one case the combined train and grade resistance is 10.5 lb. a ton, and in the other it is 11.0 lb. a ton, a difference of 5 per cent which in a train load of 5,000 tons means a difference of 250 tons. On a 1.5 per cent grade the combined train and grade resistance is 34.5 lb. a ton in the one case and 35.0 lb. a ton in the other. This increase in the resistance is only 1.5 per cent of the total, which in a train load of 1,500 tons means a difference of only 22 tons.

Another result of the exaggerated wave motion in the track just in front of the wheels of the moving train is to increase the amount of track creeping. Under the best of maintenance the question of track creeping becomes a serious one especially where traffic is heavy and runs on a track in one direction only, as it does in the case of a double track line; and the railroads of the country spend a great deal of money every year in the effort to prevent it.

The question of subsoil drainage must receive attention on all well ordered railways that operate through regions of even moderate rainfall where the soil is of such a texture that it must be drained. If the work is properly done an outlay of first expense in providing for proper subgrade drainage cannot fail to bring good returns on the investment in all the years to come. It will pay for itself many times over in prolonging the useful life of ties, in keeping the ballast out of the mud, in reducing the damage to rails, and the items of labor for maintaining track, in reducing the number of derailments, and in increasing the load and the speed of the moving train.

The way to leave footprints on the sands of time is to get out and dig.—Vision.

C. E. Kitzmiller, a Pennsylvania freight conductor at Hartsdale, Ind., twice in a ten-day period in August saved the New York Central bridge between Schererville and Hartsdale. The flames had gained headway each time.

Building operations in the United States during 1926 are estimated at $6,200,000,000 by S. W. Straus & Co., based on official building permit figures from 500 cities and towns, a loss of 5 per cent from last year. Net building costs advanced 1½ per cent. Labor conditions increased 4 per cent, and materials declined 2 to 3 per cent.

Out of all the wheat delivered to the Kansas City market, 15 per cent was smutty in 1924; 23 per cent in 1925, and 23 per cent in the summer and fall of 1926. This represents an annual loss of from $5,000,000 to $7,000,000 in Kansas alone — Kansas, the nation's leading wheat state.

The New Spirit in Aviation

What Lindbergh's Victory Means

By W. H. Harper

IT MAY be that before these lines are printed, so rapidly is history being made nowdays, some new feat in aviation shall have startled a world already popeyed with astonishment. But nothing ever can detract from the amazing story of Charles Lindbergh of Michigan, Minnesota, Missouri, California, and the country at large. Mature minds go back through American history but find nothing to equal it, and scarcely anything much in fairy tales. The World War proved that all men are potential heroes, a comforting thing to know. Lindbergh's triumphant and gracious conquest of Europe has proved there is much in this belief, as it has strengthened again the faith in heredity, for in his veins there is merged the blood of three rare strains, Swedish, English and Celtic. Added to these is the character developed in America, the world's melting pot. This character combines in an astonishing degree the greatest measure of courage, nerve, a keen understanding of danger, and iron determination; exceptional modesty where egotism might have been expected, and good temper and patience invaluable in a man subjected to the wracking strain of world adulation enough to turn the head of a veteran.

While experienced aviators backed by great wealth were fussing around in New York over making a flight to Paris, in the midst of squabbles and court injunctions and unkind words and what not, the announcement came out of San Diego that a youth named Lindbergh, 25 years old—they called him the "Flying Fool," would enter the race to France. That part of the world which had the spare time read the yarn and smiled. No one had ever heard the name. The man had no record in the air, the army or the navy. In New York, which is provincial in the extreme, and dreadfully bored by anything west of Albany, paid no attention to the story. Indeed, Lindbergh himself wasn't much impressed over the prospect. So little of the white light had come his way that friends were asked to watch the papers and save anything that might be printed about him if he made the passage successfully across the Atlantic.

The story is old now. It is referred to here for the records only. It will never be forgotten, how this youth descended upon New York, bought two or three sandwiches and some gasoline, and flew away, alone, across the sea; how he landed, 33½ hours later, at the famous airport near Paris, opened the door of his cockpit, astonished to see a crowd, and modestly informed the multitude that his name was Lindbergh. He didn't know they expected him.

From obscurity to a

Wide World Photos.

Marshal Foch, right, Shakes Hands With Lindbergh. Ambassador Herrick, center.

place among the immortals of fame, the welcome guest of presidents, kings and queens and princes, turning aside commercial offers worth millions, meeting the world's diplomats gravely and courteously, keeping his head, using the right words at the right time, cementing the vagrant friendships of nations, decorated, petted, applauded, and back to his native land on a warship sent to fetch him, the guest of his own government!

Was ever anything like it? The country tore up the sod and yelled itself blue in the face over Dewey, Hobson, Pershing, and others whose names are lost now, but all such affairs, the chroniclers declare, were tame compared with the uproarious cordiality of the reception given Lindbergh in Washington, New York, and, of course, in St. Louis, where lived the men who had provided him financial backing.

What does his mother say about this boy? A prejudiced witness to summon, but certainly interesting. She's a schoolma'am—teaches chemistry in Detroit. Fine family record except that his father served a term in congress.

"He was never a goody-goody boy," says Mrs. Lindbergh of this young man who has attracted especial attention to himself by not drinking liquor or smoking. "He has lived a life more to himself than most boys. He does not take strikingly after any of his relatives. He gets a lot of Irish from my mother's side. He takes some of the possibly more deep-seated instincts from his father. He had as many scraps in his childhood as other boys, but I never recall one in which it was necessary for us to interfere. He has been extremely lucky in not having ever been seriously injured. The only time we had to have a doctor for him was when he contracted the measles. Then it was more a case of safety first.

"I would say that the out-of-door life was characteristic of his individuality, coupled with his love of being alone—with, first, animals and then machines.

"The large farm in Minnesota on which we lived provided most of the outdoor life for the boy. He would spend entire days in the woods alone with his dog or some other animal.

"Then he took to boats. He had a treasured craft, especially designed and built by himself up there in the woods, on which he and his dog companion went boating together.

"Then he took to horses. He liked this only too well for my nerves, for it was not long until he was bronco 'busting.' He become quite proficient in this until the motor-cycle and automobile took his fancy.

"We went to Washington in 1907, and, of course, would arrive there for congress after regular school sessions had begun. Consequently he would be behind. In this manner I was kept pretty busy coaching him in his work.

"When he attended the University of Wisconsin he took his greatest interest in pistol shooting. Training in the R. O. T. C., I believe it was, he won a pistol, one of his first trophies in competition.

"He finally left the university because it was not teaching him what he liked to study, probably. Then he took to puttering about machinery. He had taken to motor-cycles and automobiles, going on long tours over the country with them."

You get the final estimate of this young man from the trained mind of Myron Herrick, United States ambassador to France. It is a good summary. Said Mr. Herrick:

"In his simple, straightforward way this boy, when asked to accept contracts for quick money, replied, 'The expedition was not for profit.'

"And what modesty and thoughtfulness are his!

"'It is easier to fly to France from America than to fly from France to America,' he has said time and time again. Modest, unassuming, gracious and with all the unmistakable spirit of a genius! When facing the greatest statesmen of France, who addressed him in superlative terms of praise, he exhibited his magnificent courage. Although unaccustomed to speaking, he unhesitatingly replied in simple, direct and most appropriate language.

"He has captivated every individual, every audience with whom

One of the Stout Airplane Freight Carriers Flying Regularly Between Detroit and Chicago Every Day in the Week.

The Newest Aerial Giant Produced in Germany for Long Distance Flights and Trans-Ocean Service to Carry 60 Passengers, 140 Miles An Hour. Its Engines Have 2000 Horsepower.

he has been in contact. His charming personality has won the hearts of the French people."

How did Lindbergh speak when the notables of France gathered around him, among them M. Bleriot, the famous French aviator? The account goes on:

"Cool and collected, Captain Lindbergh stepped forward beside the ambassador. Every one wondered what such a young lad would or could say. There was a kind of climax of emotion in the room of which it would be difficult to maintain the peak, and even more difficult to descend from without an anticlimax. Yet Lindbergh did it.

"Gentlemen," he began, looking around and speaking clearly so that every one could hear, "one hundred and thirty-two years ago Benjamin Franklin was asked: 'But what good is your balloon? What will it accomplish?' And he replied: 'What good is your newborn child?'

"Less than twenty years ago, when I was not far advanced from infancy, M. Bleriot, here beside me, flew across the English Channel, and he was asked: 'What good is your airplane? What will it accomplish?'

"Today those same skeptics might well ask me what good has been my flight from New York to Paris. My answer is that I believe it is the forerunner of a great air service from America to France, from America to Europe, which will bring our peoples together, nearer in understanding and in friendship than they have ever been."

That was all, but it moved those representatives of France as eloquence could not have done, and satisfied them by its wise completeness.

"He is a modern Parsifal, this 'Flying Fool,'" one Deputy exclaimed in admiration of this modern hero, and added:

"All Parsifals are fools to ordinary people."

They don't call him the "Flying Fool" any longer. He is Colonel Lindbergh, of America, now.

"Every man's life," said Hans Christian Andersen, "is a fairy tale written by God's fingers."

Air Lines for Freight Are Coming

The influence of Lindbergh's flight to Paris was shown in many ways during June, but in none more strikingly than when R. H. Aishton, veteran railroad man, president of the American Railway Association, said in New York:

"While I feel that air transportation of freight will not offer railways serious competition for several years, aerial transportation of freight is inevitable. Any development of transportation is a boon to civilization."

He added that freight transportation by planes is a matter for future experimentation, but that the progress of the last few weeks warranted his prediction.

The carrying of foodstuffs and other perishable commodities would mark the advent of freight transportation in the air, Mr. Aishton said. Regular freight lines prabably would be inaugurated by the Zeppelins or heavier than air machines, and later extended to airplanes with the further development of the latter craft.

In St. Joseph, Mo., Also, They're Organizing

In the first annual conference of an organization for the development of commercial aviation in St. Joseph, Mo., early in June, development of aviation as a future auxiliary to national defense and as a means of placing the United States on an equal aeronautical footing with other countries was advocated.

Charges that this country was laggard in developing aviation and that it was struggling under an "inferiority complex" in regard to army, navy and commercial aeronautics were denied by William P. McCracken, Jr., assistant secretary of commerce; F. Trubee Davison, assistant secretary of war, and Edward P. Warner, assistant secretary of the navy, principal speakers.

New Life Everywhere is Reported Daily

Washington reports indicate that commercial aviation is gain-

ing a strong foothold throughout the world, latest reports to the commerce department show conclusively.

In all parts of the world the new method for passenger, freight and mail transportation is being used more frequently and additional facilities are being installed every day. From Copenhagen come reports that a new passenger service has been established between Vienna and Malmo, Sweden. Stops are made enroute at Prague, Dresden, Berlin and Copenhagen. Planes leaving Vienna arrive in Malmo in time for night train connections with Stockholm.

The first restaurant service on any commercial air line has been established on the new Genoa-Naples line.

Air mail service is soon to be established between Adelaide, So. Australia, and Perth, Western Australia, Julian B. Foster, assistant trade commissioner at Melbourne reports. The service will save from three to four days in delivery of letters between the two points.

Hydroplane passenger service between Vera Cruz and Progreso, Mexico, with stops at Puerto Mexico, Frontera, Laguna and Campecho has been started, according to advices from Vera Cruz. One plane accommodating eight passengers and one ton of freight has been put into service. The fare on this route is $60, the same as that charged by steamers. If the line proves successful other lines will be opened.

The task of surveying the Khasa and Mahl forest reserves has been turned over by the government of Bengal, India, to a commercial air firm at an established cost of $3,600,000. Eight hundred square miles are to be surveyed in about six months.

Winter passenger service has been established between Reval and Helsingfors. The voyage lasts 45 minutes and metallic Junkers limousines accommodating four passengers are used. The fare is $13.50.

The Imperial Airways, Ltd., operating across the English channel between France and England completed 2,358,050 miles of flight between April 1, 1924, and Dec. 2, 1926. During this period 38,229 passengers and 2,117 tons of freight were carried.

Passenger planes in Australia have flown 1,500,000 miles without accident. A commercial line there with 1000 miles of airway is doing a flourishing business, offering passenger, mail and freight transportation.

H. H. Kelly, trade commissioner in Paris, reports that French aviators are determined to capture additional world's records, particularly for non-stop flights. Three different groups are preparing machines for a Paris-New York jump. Six round-the-world flights are under consideration and three groups are planning to better the record between France and Madagascar. Several flights across the Atlantic from Africa to South America are being planned.

Are We Still Timid in the Air?

A metropolitan newspaper writer, in a sharp editorial, declares America is slow, and the goes on to prove it to his own satisfaction. "Aboard any British liner for Europe," says he, "you are notified you can engage space and buy tickets of the purser for air trips from London or Manchester to any of a number of cities on the continent.

"In aggregate mileage flown, the United States leads the world, but there are no such notices of air conveniences here on ships coming this way.

"The nation which invented the airplane has still something to learn about its utilitarian use."

No Timidity Out Here at All Events

What should you have said, 20 years ago, if the morning paper told you at breakfast that the Business Men's Association of one city had piled into a lot of airplanes and flown to your town and back again for dinner, a few hundred miles?

It happened one day in June in Los Angeles, when 20 airplanes landed at the Western Air Express airport bringing a party of more than forty members of the San Diego Federal Business Men's Association for a meeting and luncheon at the Los Angeles Chamber of Commerce.

The visitors left San Diego about 9 o'clock, landed in Los Angeles from 10:15 to 10:30, were taken for a short drive, had lunch, talked and exchanged courtesies with the local men, were driven back to the airport and were back in San Diego before 5 p.m.

The occasion was the annual get-together meeting between the San Diego federal employes and the Los Angeles federal employes, through their mutual organization.

The arrival of the visitors at the airport was a sight worth traveling far to see. The first plane arrived shortly after 10 a.m. and for the next half hour or so the air was filled with roaring planes of all sizes and descriptions, from darting mosquito-like affairs to the great naval bomber with two giant motors. The pilot of the large plane brought his ship down and despite her great weight and size contacted the hard ground with the ease and grace of one landing on an air cushion, much to the admiration of the gathered spectators.

Naturally the enthusiasm for aviation was the keynote of the meeting and the talking. Lindbergh and Chamberlin and their feats were uppermost in thought and speech. The opinion was frequently expressed that these great flyers have merely blazed the trail. Great achievements in aviation are at hand. The next big thing is to span the Pacific in one hop.

Chamberlin's Flight a Strong Influence

Clarence D. Chamberlin's nonstop flight from New York to Germany with a passenger was hailed

by Washington officials as the harbinger of regular commercial airplane service across the Atlantic. The flight was also interpreted as a warning that the Atlantic can no longer be considered a safe military barrier against hostile aircraft.

Admiral William A. Moffett, chief of the bureau of aeronautics, struck the keynote of the opinion of naval air men with the assertion that Chamberlin's achievement should "open the eyes of the people to the necessity for adequate air defense and increase confidence in the practicability of commercial aviation."

"By carrying a passenger from New York to Europe," Admiral Moffett said, "Chamberlin has proved that a useful load, commercial or military, can reach America from Europe by airplane and that the Atlantic is no longer the complete barrier it was supposed to have been."

Chamberlin's flight was hailed by Secretary of the Navy Wilbur as a demonstration not only of the skill of American pilots, but of the reliability of American engines and planes. Secretary Wilbur stated the belief that it would be only a matter of a few years before it would be possible to fly planes regularly and safely across the Atlantic. He called attention to the fact that both planes used by the trans-Atlantic flyers were air cooled and had been developed in cooperation with the navy.

Travel by Airplane is Growing Rapidly

French air traffic statistics for 1926 show the number of passengers, by nationality, flying from France to England, Belgium, Holland, Germany and the Scandinavian countries: American 42.3 per cent; English 32 per cent; French 5.3 per cent; Dutch 5.3 per cent; German 1.5 per cent; miscellaneous 13.6 per cent. Statistics of passengers flying from France to Africa (Morocco and Algeria) and return: French 82.7 per cent; Spanish 7.3 per cent; English and American 4 per cent; Miscellaneous 6 per cent.

The Little Gadget in Front of Robert Milton, Inventor, Is the New Gyroscopic Stabilizer and Automatic Control. Milton Flew for 45 Minutes without Touching the Controls.

Which Paper Was It?

Speed in transportation had a fascination for Richard Barnett of Aberdeen, Wash. He was much worked up over Lindbergh's airplane flight. When news came of the Colonel's safe arrival at Paris Barnett reached for an extra paper and fell dead.

Some Famous Journeys

The flight of Lindbergh across the Atlantic brought out in June some interesting history of other flights less spectacular but equally important in their day.

Lindbergh made the trip in 33½ hours.

Columbus sailed from Palos, Spain, August 3, 1492, arriving at San Salvador October 12; time elapsed, 69 days.

The Pilgrim Fathers sailed from Plymouth, England, September 6, 1620, and arrived at Cape Cod November 9, 66 days later.

Dreadnaught, Yankee clipper ship, sailed from New York June 15, 1859, arrived at Cape Clear, Ireland, on June 27. Time elapsed 12 days.

Savannah, first steamship to cross the Atlantic, from Savannah, Georgia, to Liverpool, leaving Savannah May 24, 1819, crossing in 27 days.

Great Eastern, famous early steamship, sailed from Needles, off Southampton, England, June 17, 1860, arrived at New York June 28; time elapsed, 9 days.

Mauretania sailed from New York to Cherbourg in September, 1924; time elapsed, 5 days 1 hour and 48 minutes.

Zeppelin dirigible Zer-3 (later Los Angeles) sailed from Frederickshafen, Germany, October 12, 1924, arrived at Lakehurst, N. J., October 15; time elapsed 81 hours, 17 minutes.

British biplane (Alcock-Brown) took off at St. Johns, Newfoundland, June 14, 1919, and arrived at Clifden, Ireland, June 15; time elapsed, 16 hours 12 minutes.

Air Service New York to San Francisco

Passenger airplane service between New York and San Francisco will be available to the public in a little more than two months, George P. Tidmarsh, representing the Boeing Air Transport Corporation, announced June 20.

Planes will make the trip in about 30 hours, cutting nearly three days from fastest train schedules, he said.

The Boeing concern began operation of the Chicago-San Francisco air mail route July 1. It is to use planes having accommodations for two passengers in addition to the pilot and the compartment for carrying the mails, Tidmarsh explained.

August 1 the National Air Transport will begin operating the passengers and express matter in addition to the mails.

How Lindbergh Kept Warm

A good many inquisitive persons wondered how Charles Lindbergh was able to stand the cold which everyone supposed he suffered in crossing the Atlantic in an airplane. An inquiry developed that Lindbergh's plane made by the Ryan Airlines, was made com-

fortable with a lining, a kind of insulation against cold, known as balsam wool. This insulation is like a blanket. It deadens sound and vibration and is extremely light in weight. Balsam wool is one of the by-products of the great lumber industry of Minnesota. The Wood Conversion Company of Cloquet makes it.

All Up in the Air Nowadays

How the imagination of youth has been gripped by the glamor of transatlantic flying is reflected in applications for service with the army air corps. During June candidates for flying honors have more than doubled the usual quota at recruiting stations and inquiries about the service have swamped information officers at the war department. At the navy department it was impossible to record in figures the effect of the Lindbergh-Chamberlin flights upon recruiting, because the sea branch enlists its personnel for general rather than particular service.

Speeding Up the Air Mail Service

With generous appropriations from congress, the department of commerce has ambitious plans in mind when it takes over control of the transcontinental airway this month. The most important is the arrangement that will bring San Francisco and New York still another business day closer to each other through which air mail patronage is expected to be greatly increased.

At present the air route between the two terminals of the transcontinental line is flown during two days and one night. It is proposed to reverse the order and have the distance covered in two nights and one day.

By this arrangement the transcontinental plane will leave San Francisco about 9 p.m. after taking on all air mail posted before 6 p.m., which would arrive in New York on the morning of the second day in time for delivery before noon.

Los Angeles-San Diego and Seattle-Tacoma would have similar service through planes connecting with the transcontinental line at Salt Lake City.

When this schedule is put into effect, Pacific Coast air mails are only one business day removed from New York and other eastern points.

As the schedule is now, most transcontinental air mail remains in the terminal post offices all night on the day it is to be posted and another night on the day of its arrival at its destination. These two 12-hour delays are wasted and it is proposed to eliminate them.

This change cannot be brought about over night because of the many miles of air way that must be lighted for night flying. Captain F. C. Hingsburg, chief engineer of the airway division, is hard at work, preparing plans for the lighting of the entire route between San Francisco and Salt Lake City, with other elaborate plans for the weather reports the entire way across the country, so a pilot before he takes off, will know what weather to expect before he arrives at his destination. He will know the average height of the clouds, the wind velocity and the barometer readings.

Radio installations, costing approximately $260,000, will be made along the airways of the country during the next fiscal year, and most of this money will be spent on the transcontinental route. When this equipment is installed, light-keepers and landing officials will be able to talk with pilots in the air. A new device has been perfected in which the pilot's ear-phones are built into his helmet.

The department has just adopted as standard a radio set weighing eight pounds for installation in all planes engaged in regular flying service. This set is eight inches high, twelve inches long and three inches thick. It has five tubes with a regenerative circuit.

Buy a Plane on Easy Payments Now

Airplanes can now be purchased on the installment plan. A London firm has offered to sell De Haviland light 60 horsepower sport planes by the partial payment method, the government was advised today by its consuls.

P. O. Dept. Sells Planes

Twenty-six Douglas air mail planes were sold at auction in Washington, June 16, by the post-office department. The National Air Transport, Inc., of Chicago, bought seven planes at $7000 each, nine at $6000 each and one at $5000. The Robertson Air Corpn. of Anglum, Mo., bought one at $5050 and five at $5000. The Western Air Express of Los Angeles bought one at $6200, one at $6510 and one at $5285. There were no bidders for the other planes offered.

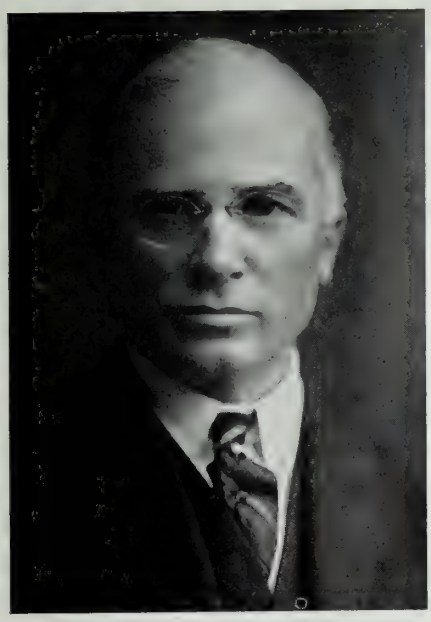
The planes are no longer needed, inasmuch as the air mail service is being turned over to private enterprise.

World Tour Next Year In 300 Hours

While preparing for a visit from the American trans-Atlantic flyers, Clarence D. Chamberlin and Charles A. Levine, to the Friederichshafen wharf, Dr. Hugo Eckener, director of the German Zeppelin works, announced June 18 that his new ship, the L. Z. 127, which is under construction now, will circle the world in 300 hours, in 1928. Anchorage stations, in Russia, near the Pacific, and three in the United States, including the present one at Lakehurst, N. J., will be needed for the trip.

The man who does his best is a success, whether the world thinks so or not.

Little Stories About Big Men



Daniel Willard, President, B. & O. R. R.

A RAILROAD strike, or any other kind, begins as an economic struggle. Within a few hours it becomes a social tragedy. This is not a story about labor troubles or an argument for or against strikes, but the philosophic observation in the first sentence is necessary here because of what follows. Doubtless the social aspects of a strike are much the same wherever men combine to resist some real or fancied grievance, but it has always seemed that on a railroad these aspects were particularly accentuated, perhaps because they are more familiar to the present chronicler who knows little about any other kind of business. There was a locomotive engineer on an eastern road, a good many years ago, never mind about the dates, who stood high in his craft because of his outstanding leadership. What he did or said was talked about and quoted. For one thing he knew his engine from the tip of the pilot, which some persons still call the cow-catcher, to the rear end of the tender, inside and out. He took good care of it, too, in a day when an engineer and his fireman might, conceivably, repair a running board or open the front end of the locomotive, whatever it's called, instead of requesting four or five different craftsmen with helpers to do the work for them. This man had come up to the throttle through the wearisome jobs of hostler and fireman, and as a result, overlooking the reiteration if you please, he did know his engine. It was natural that he should be considered a leader. But he was a peaceful chap. He was no firebrand of discontent. He didn't try to start something just to see what might happen.

And one day talk was heard of a strike. Who started it or what the trouble was about isn't important now. The interesting fact is that gossip hadn't been circulating very long before the men, always wavering around in search of a leader, began to wonder what Dan Willard would do when the showdown came—Dan Willard, the engineer. What were his views?

How the matter was adjusted and the strike avoided is not pertinent here. The passing years have served to bury such things anyway. What Dan Willard intended to do if a strike was ordered is the question before the court, and the answer to this interesting inquiry might never have come out had not the shop crafts decided to go to the mat with the railroads a few years ago, and with them, some of the men in the train service who harbored the funny idea that the best way to help the shopmen in their troubles was to lose their own jobs.

Labor never had, and still has no better friend than Daniel Willard, president of the Baltimore & Ohio. Indeed he is so exceedingly staunch in his advocacy of the square deal that one might be excused for expressing the belief that he was entitled to very much better treatment than he received from the men during the unhappy days of 1922. However, returning to the previous question, Mr. Willard was asked, one day, what really were his intentions when strike talk was flying around, back there in those early years.

His face was very solemn looking. "I think I understood the men," he replied, finally. "Once the men are out it's a social matter. When it began to look serious I asked myself what should I do, what would I do? The fact that I had no grievance didn't enter into the matter. If the men went out what would I do? I made up my mind one day that if they went out I would go out with them, because I was one of them, they were my friends and neighbors—I would go out, but I never would go back again. It would end railroading for me."

In view of the remarkably important and valuable contribution Mr. Willard has made to the science of steam transportation, considering the high place he has reached in American railroad annals, isn't it permissible here to offer a vote of thanks to those turbulent railroaders of another day for sticking to their jobs? May we not be forgiven for adding here a very trite and shopworn aphorism to the general effect that "a word, a step this way or that, a turn around the corner, sometimes will change the current of a life."

There is, at times, a grim and melancholy satisfaction in meeting some man of importance who has lived a clean, upright, useful life of good citizenship without saving enough money to wad a 22-caliber pistol. Such a man is certain to

be a human kind of human being. He understands the other fellow. He knows the severest pain suffered in this world by ordinary men is caused by the penurious bachelor who carries his car fare in a dirty little purse, and is never so happy as he is in telling his few married friends how to save money and bring up their children.

All of which sombre reflections grow out of the perfectly delightful frankness of C. A. Markham, now chairman of the board of the Illinois Central, and formerly its president. Mr. Markham was speaking at the dinner given one night in November, three years ago, at the Blackstone hotel, Chicago, to Charles M. Kittle, senior vice president of the Illinois Central. Mr. Kittle, like a good many other valuable men, has discovered that Big Business offered advantages not to be found in the railroad field, and had accepted the presidency of Sears, Roebuck & Co., perhaps the largest mail order house in existence. With the engaging and half-humorous candor for which he has become conspicuous, Mr. Markham said to the large assemblage,

"In my own experience, and it has been somewhat along the same lines as Mr. Kittle's, going back 20 years, when I was about the age he is now, I too left the railway service, but under entirely different circumstances and conditions. I was forced to leave, in a way. I may not look it this evening, but the fact is that at that time, having been unable, out of my salary in my 23 years of railroad service, to save anything worth while, I found myself unable to obtain life insurance; and when a misguided oil company came along and offered me an opportunity under a five-year contract, if I lived that long, to acquire a small competency, I quit the railway game and went into the oil business."

Then, still in a reminiscent mood, Mr. Markham added that Mr. Kittle now had a chance to acquire a fortune. He went on:

"I jocosely said at a dinner similar to this held in San Francisco about 20 years ago when the officers of the Southern Pacific were telling me good-by that I was going into a game where the opportunities for making money were very large, and that while I had no thought or intention of ever returning to the railway service, perhaps in time I might be so fortunote as to make enough money out of the oil game to come back and buy an interest in that great railroad."

When this story about Charles Kittle was read, recently, to one of the most influential financiers in the country, he said a few words which, fortunately, were put away in a little book. "I often wonder when I read these things," said the man of millions, "just what is the process of reasoning, if I may call it that, by which railroad directors figure out their duty to the public. They are always telling us how they are economizing. Is it economy to train a man for ten or twenty years, to the point at which he is fit for heavy responsibilities, a training that costs very large sums of money, only to let some business or industry outside of railroading take him away for a few thousand dollars more on his yearly salary? Is that saving money for the public? I am engaged in four kinds of Big Business, and let me tell you, within reasonable, sensible limitations, no outfit can take our men from us. It cost us too much to train them. If a man isn't worth keeping no other business wants him."

Incidentally, but nonetheless interestingly, it is worth recording here that the great mail order business referred to a moment ago was founded and built to great proportions by a railway man. That was Richard W. Sears, born at Stewardsville, Minn., the son of a blacksmith. Young Sears had to quit school at 16, when his father died, and go to work. He became station agent at Redwood Falls, then a little country town on the M. & St. L. R. R. One day Sears conceived the idea of selling watches through railway agents to railway men. His scheme was to consign the watch C. O. D. to any man that he might think of at some station along the line, with the usual instruction to the agents that if the shipment was not delivered in five days, notify the consignor. When he got the notice that he knew would be forthcoming, he would write immediately to the agent and say that he was sorry the man had not shown up, but if he would sell the watch to someone else and remit the money, he could keep $2 for his own trouble.

In six months Sears accumulated $5,000 profit on his plan. The possibilities of the mail order business began to dawn upon this young railway man, so he moved to Minneapolis, bought a 50-cent chair and a kitchen table, and went to work. His business grew and he moved to Chicago. He opened an office on Dearborn street under the name of the R. W. Sears Watch Co. At the age of 21 he sold out for $100,000. Not long after selling his watch company, he and a foreman who had worked for him in the watch business, A. C. Roebuck, created the firm of A. C. Roebuck & Co., the name of which in 1893 was changed to Sears, Roebuck & Co.

This young railway man who started the business from one watch retired as president of the company in 1909 after seeing the business grow, from nothing to gross sales in the last year of his connection with the company amounting to $53,000,000!

He missed the advantages supposed to result from having a college education. His father died when the son was four years old. He had to hunt up a job—any kind of a job—just as soon as he quit high school, and he had to labor like the well known Turk while he was going through that

institution. He had no influential friends to help him after he faced the world at 16, with real domestic responsibilities to shoulder. He had no special training for the job he finally landed, but he got plenty of it in the job itself, an apprentice in the machine shops of the Santa Fe System. In brief, he found himself right where many a youngster has been in days gone by and many another will be in the days to come.

But there was this difference: Paul Shoup couldn't be kept down. As a result of courage and determination and hard work he went up in the field he had chosen to cultivate. And look where he is today, will you?

There isn't anything very remarkable or unusual in Paul Shoup's origin, his struggle for a place in the world, or in the fact that he pulled through and landed at the top where he deserved to be. The story and the moral example are valuable because the young man did so many things that others have done and still recorded such amazingly different results. Thousands of young men, doubtless, are flung into the world at a distressingly early age, go up against the unsympathetic and very competitive crowd, have the most obscure and disagreeable duties, and encounter just as many fine opportunities as Paul Shoup ever had. But here again is the difference. Thousands are so tirelessly occupied watching the clock for quitting time that they fail to see the chances passing by. While they were deep in the hay Paul was right at the door with one hand on the knob ready to open it when old man Opportunity came along. Thousands of young men equal to Paul Shoup in mental equipment and much his superior physically, never expected to get anywhere in particular when they started. They had no destination in view, no great objective. Especially they developed an aversion for 12- or 15-hour days, and as a matter of personal taste they abhorred perspiration.

Where are these thousands now? Where are the apprentices and the mechanics and the baggage smashers and the telegraph operators who worked right along at Paul Shoup's side in those early days? As well inquire about the water that went under the wheel,

Paul Shoup, Vice President Southern Pacific Co.

or the flowers of a vanished summer. Where is the meek little chap who thought $35 a month perilously close to financial arrogance? A moment's glance at the little Pocket List will show you where he is—the senior vice president of the great Southern Pacific Company; the president of the Pacific Electric Ry. Co.; the vice president or director or chairman of this and that and a lot of other things outside the railroad itself, one and the same man in all of them, and he, to quote the popular novelist's method of disclosure, none other than Paul Shoup.

He was born in San Bernardino in 1874, and he came into his own, as the saying goes, in Los Angeles and San Francisco. A day's journey, it is, to the northern city if you are going straight through. But Paul Shoup had a great many engagements along the way, many important things to do, so that actually it was years before he registered in up there, and along the line was the history of a life well lived, and mighty satisfying to him and his family and friends.

You couldn't get these things out of him if you served a court order on him. When it comes to writing a "Little Story" about Paul Shoup you discover he's as hard to control as a gun-shy bird dog at target practice. He just won't stand.

The Shoup family moved from Iowa to San Bernardino and there, in January, 1874, Paul was born. His father was a lawyer. He died when the boy was four years old, and the mother took the five children back to the former home in Iowa. There she ran a country store, taught a little school, worked hard as women must in such circumstances, and eventually, when Paul was 14, returned to California.

Hard times teach children the value of money, how many cents there are in a dollar. The Shoup children learned their lesson. Paul "carried a route" for a Los Angeles newspaper at 14, and eventually became its local reporter in San Bernardino. It is said he did good work, too. At all events he pulled himself through high school. With this put behind him he had to have a full time job, and this he found in the Santa Fe shops when he was only 18. He didn't stay there long. He came mighty near giving up railroading in favor of a writing career, but the Power watching over the shorn lamb and tempering the wind, saved him, and the boy got a job with the Southern Pacific hustling baggage for the little dummy line that took people to Redlands in those days. The closest investigation fails to show that any time did Paul Shoup "accept a position" anywhere—always he was getting jobs. The interesting thing, though, is the trait he developed of eternally learning

something else outside these jobs, until it became pretty certain that if Opportunity tapped on P. W.'s lintel and got by, he would have to be all-fired gentle about his tapping. Paul learned photography, he became a telegraph operator, he mastered shorthand. He had a real job as a stenographer for a time, and then was put in charge of a new publication for the Southern Pacific, the Sunset Magazine, on which he was editor, photographer, manager and other things. Indeed, the Sunset Magazine proved in 15 years to be a valuable property and was sold.

When Paul Shoup was 27 he became district freight and passenger agent at San Jose. From that time onward his rise was fairly rapid. Nobody "discovered" him. He just worked hard. His superior officers learned that when something had to be done Paul Shoup was the man for the job. E. H. Harriman liked him as he liked any dependable man, liked his good sense and tact, his judgment and courtesy, his kindliness. But Harriman didn't discover him. Paul Shoup was the kind who couldn't be overlooked. It seems queer, perhaps, but the man who really works for his employers, who isn't a slacker, a clock-watcher, a thief of time, is so rare that he never is overlooked.

Paul Shoup has always been a student, in school or out, a constant reader, a corking good writer, a scholar. Someone asked him once what, precisely, was his philosophy of life. He smiled a bit. " 'To thine own self be true,' " he quoted, " 'and it will follow, as the night the day, thou cans't not then be false to any man.' "

Mr. Shoup's whole career is an inspiration to young men, especially in railroading. But while he was digging into Shakespeare, he might just as well have given the rising generation that other immensely suggestive thought:

> The fault, dear Brutus, is not in our stars,
>
> But in ourselves if we be underlings.

Secretary Hoover Says:

"The railway managers have not alone provided a sufficiency of transportation and therefore cured a thousand ills in the business world, but they have shown an extraordinary capacity in the improvement of the efficiency of our railroads.

"Recently we had a canvass made in part of the wholesale and retail lumber trades; and we found that the retail lumber dealers were able to carry on their business with approximately four billion less board feet in stocks than six years ago, estimated to result in a saving of over 600 million dollars of capital in that one industry.

"One of the reasons for the stability in our price levels has been the fact that goods move quickly, and that there is not the stimulus to rising prices and the pyramiding of orders that come about in the face of any suspension of ample transportation."

The Reason Why

The reason that shelves are not loaded down with goods; the reason that merchants' money is not tied up with large stocks; the reason the consumer does not have to pay extra prices because of the tying up of stocks; the reason why merchandise throughout the country, even in the distant small town stores, is "up-to-date"—the reason for all this is simply that the railroads now carry goods so quickly that it is no longer necessary to load up with a season's goods.—Fort Worth Star-Telegram.

Railroading in China

China is much in the limelight these days, and the cables are runing hot with the squabbles of the Cantonese and the Northerners and their political moves and counter moves with western nations. We hear occasionally about Sun's troops being rushed hither and thither by rail, together with various references to "trainloads" of troops, but not a word about the trains themselves, or their working. In the light of a recent report, however, silence on the point, from the Chinese viewpoint, is perhaps the better part of discretion. A newly opened line, we are told, running from Pootung, near Shanghai, to the coast, a distance of 10 miles, is chiefly remarkable for its assorted collection of rolling stock. The entire equipment comprises two small tractors, a converted tank, an English omnibus and a donkey engine. The schedule is notable for its elasticity, the arrival and departure of trains being governed almost entirely by the whims of the train crew. Some railroad!

Women in Railroad Service

Women are employed in practically every branch of railroad service, according to a statement issued by the Interstate Commerce Commission as a result of a special study made at the suggestion of the women's bureau of the department of labor.

The commission's report shows that there were 61,302 women employed by Class I railroads October 1, 1926, as compared with 90,052 in October, 1920. The class of work which employed the largest number of women was that of clerical or semi-clerical occupations, in which 51,127 were employed. The next most numerous class was that of cleaning, in which 3,332 women were employed. There were also 641 in the car department, 1,184 in personal service, 295 in roundhouse work, 2 in train service, 290 in shopwork and 1,427 working as telegraph and telephone operators.

Happy is the man who can see, in the results of his efforts, more than an isolated, personal achievement—who can view the organization, of which he is part, as a whole—who can see down to the roots of it, and know that from these he draws strength and ability to achieve.

The Chairman Talks to Students

A Harvard Man at Carlton

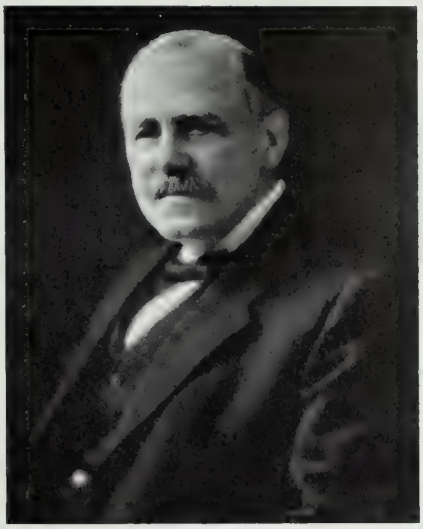
By Howard Elliott

THE world in 1881 was much different from the world we have today. Yet the obligations that rested upon the graduate in 1881 were similar to those that rest upon him now. John Marshall, the first Chief Justice of the Supreme Court, said of the Constitution of the United States that constitutional principles did not change, but that the interpretation of these principles and their application to conditions of life changed with each successive generation and with the introduction of new ideas. The rules of life do not change, but their application must be adjusted to new modes of living, and they must be extended to cover a very complex civilization.

The college graduate faces problems today that are similar to those 50 years ago, only they have grown greater. The graduate is looking out into the world and wondering what will happen. Some may have their life work selected. Most must make their own choice and deal courageously with such opportunities as are offered. I have never been much of a believer of the "round peg in a square hole" theory. In the majority of cases, I believe if a man has in him the elements of success and works long and hard, he will succeed in one field of human endeavor as well as in another. What is learned from books will be of value, not only for the knowledge gained, but because the mental training will help when new conditions are met. What is learned of human nature by association with others will be of great use.

Graduates are now going to engage in the great game of life.

In this great game each must play a part and, in the next 50 years, more attention must be paid than ever before to some of the great unsettled human questions that affect the lives of all.



Howard Elliott

The value of a college training to this game of life will be measured by the success that graduates achieve in handling the problems of their time. The complications of modern life, the luxuriousness of it, and the consequent increase in the cost of living, are forcing the country to analyze carefully the whole subject of higher education. There is such a demand upon the colleges and universities, that more and more must the country consider whether the applicant for higher education is capable of taking full advantage of the opportunities offered. The country cannot afford to waste brains, time, energy and money upon those who misuse their brains, time and energy while they are in college. Hence, there is a growing tendency for more severe entrance requirements, both mental and physical; a tendency to limitation of numbers; a tendency to drop students out of college who appear unwilling or unable to make wise use of their opportunities; all this, so that so far as practicable the best men and women will be trained for the use of the nation.

There are some who doubt the wisdom of a college education for so many, and they raise the question as to whether it is best for the country. I am not one of those, but the results of higher education must be balanced against the effort and cost. One of the important questions before the country is that of educational finance and administration, with the purpose of improving the quality of the training and at the same time reducing the expense.

There are today over 600,000 undergraduates in colleges and universities in the United States, exclusive of professional schools. In 1880 there were about 30,000 and only one in 100 youths went to college, while today it is one in twelve. The college population has doubled, even in the short period since the World War.

These 600,000 young men and women, supposedly the best in the land, are taken from the ordinary work of the world and supported in a pleasant academic atmosphere. During that time the work required of them is not very arduous. Here in Carleton, for example, the average time for class room and athletic work is perhaps 19 hours a week. If an hour's reading and study is added for every class room hour, this makes a working week of about 38 hours. It must be admitted that this is not an arduous task for young people in fair physical condition, and it must be remembered that this lasts only for nine months, with several recesses and vacations. The col-

lege year consists of approximately 34 weeks of 38 hours each, or 1292 hours out of the 8,700 hours of a year, or about one-seventh of the time.

A recent article in the Atlantic Monthly gives interesting figures about the cost of a college education. It states that the average cost to the parent of sending a student through college is $1,500 a year. For 600,000 students this means 900 million dollars a year? It seems as if this is too high because it is well known that a great many students do not spend $1,500 a year, but, in any event, the aggregate cost is large. It may also be said that tuition, room, board, and expenses incident to college life, that are paid by the student, do not represent the total cost of his college years. The writer of the article estimates that about two billion dollars is a fair estimate of the annual cost of college education to this country. This large sum means that the country is spending more than $100 a week for putting those 600,000 young people through college. Some think the results of the college training do not justify the expenditure of all this money. The United States, however, is a very large and rich country, and should not be unduly disturbed in the expenditure, which is about one-seventh of the annual motor vehicle bill. I, for one, think the expenditure is justified, provided the college graduate proves that the $100 a week has not been wasted.

Why are young people sent to college? Not merely to enjoy four years in pleasant surroundings; not merely to learn to read the Odyssey in the original Greek, or the Aenoid in the original Latin; not for a scholarship that will be an instrument of abstract investigation only. They go to obtain a scholarship that will be an instrument for better life and living; for a training that will ultimately make them better able to do their part of the work of the world.

The country that provides the money expended on higher education has a right to ask that the college graduate take an intelligent part in the government of the nation, state, county and city. In a democracy like the United States, one of the important purposes of education must be to train men for citizenship and government. In a democracy, the people rule; theirs is the power; theirs is the voice that commands, and a democratic government can be no better than its people.

John Bright, the English statesman, once said that he could stand on the Strand, the busiest street in London, and take the first 500 persons who came along, put them in the British Parliament and have a successful government. Experience has shown that that statement was not sound. The government cannot be run wisely by any chance selection of inexperienced people. To mean well is not to govern well. The idea that any man, however, untrained, can administer a nation's government efficiently still lingers in the minds of many, and yet no business would choose its employes that way. No college board would select a president and teaching staff in that way; no one would select a doctor or a lawyer on this basis. To govern the United States and the various political subdivisions wisely and efficiently requires the highest degree of intelligence and training.

The country, therefore, has the right to look to the graduates of Carleton, and to the 600,000 college men and women everywhere, to so train themselves that they can take an intelligent part in political affairs.

If it is true that the college graduate must make an intelligent contribution to the nation's government, it is equally true that his career must make a contribution to the nation's business.

Many fine men have not had college training, but the reason for having colleges is to produce even better men and women who will do better work for the nation. Unless this is the result, the time, energy and money devoted to educating and training young people in college might better be devoted to some other national purpose.

Much is expected from those to whom much has been given. The country requires the loyal service of every man whether he goes to college or not. But from the college man the country requires more than the average. It is expected of you, as college men, that you should make a contribution above the average in carrying on the government, and that you should be leaders in the business or professional life of your community.

It is probably true that the average boy will be able to make enough money for his own support, and eventually be the support of his family. He is not sent to college for the sole purpose of increasing "enough money" into a fortune. This is a very rich nation; its wealth in 1925 was three hundred and eighty billion dollars. Vast sums are spent for what a few years ago were considered luxuries. You naturally want your share, but the winning of riches does not always mean a happy and useful life.

Mr. Elliott on Colleges

THE chairman of the board of directors of the Northern Pacific Ry., Howard Elliott, was graduated at Harvard in 1881. No man in the railroad world is better known or more admired. His home, because of his duties, is in New York City but he has never permitted himself to lose contact with the West where, as president of the road over which he now presides, he learned to know the people and like them. Mr. Elliott went up to the little town of Northfield, Minn., in June, to receive an honorary degree from Carlton College at its annual commencement. A part of the interesting address he made on that occasion is presented here. The 900 students and the hundred or more members of the faculty, with a graduating class of 150 listened to the veteran railroader with close attention.

But They Weren't Dried Parsnips

A Tragedy in Claims

By Walter Cameron

FIVE dollars for a barrel of old dried parsnips seemed a fair price. The shipment had come from abroad marked only to "XY Diamond," and under that mysterious heading it had somehow been delivered to the Milwaukee railroad. No one knew what the stuff was until a little chap who had been hanging around the freight house said it was dried parsnips.

"Why anyone should ship dried parsnips to this country was too much for me," said the claim agent, telling the yarn in the St. Paul convention of the claims division. "Personally, publicly and in private I detest parsnips, fresh or dried. So when this queer little fellow said he could sell this barrel of stuff for $5 it seemed too good to be true. It was, too, as a matter of fact, but we didn't know this until much later, about a year later if you pin me down to dates. We'd forgotten all about the silly old parsnips, what with this and that and many other important things to attend to, when along came a claim for the real value of the barrel and contents. It had been traced to our line and delivery proved, almost becoming an international affair as it moved along. It wasn't a barrel of dried parsnips, will you believe me?, but a very rare and important vegetable drug—ginseng—and it cost us $1,700 to settle. I have never seen the little chap since the day he sold the shipment—for $5."

Easily first as a trouble maker for railroads is failure to remove or efface old consignment marks from boxes and packages. One authority estimates 80 per cent of all marking irregularities come under this heading and he adds, "A majority are against jobbing houses." At one transfer station, where the volume of business is not large, the agent reports holding an average of 200 shipments a month that carry wrong marks. Reports from freight agents in all parts of the country indicate that this feature of the marking question deserves more attention than any other.

If people will persist in shipping household goods improperly packed they shouldn't be dismayed if there is some little difficulty in picking the oil stove out of the piano at the end of the trip. It isn't easy—even with ball bearings—to stop and start 50 or 75 cars of freight without jerks. Big shippers, firms that have hundreds of cars moving every day have learned, and still are learning these things, thanks to the educational work of the carriers. And shippers have learned another thing of great importance: that even if their claims are paid promptly, which is more the case now than it used to be, they still are very costly, and they are joining the railroads cheerfully in the never-ending campaign to cut them down.

Bundle of Chairs Properly Wrapped and Tied.

Loss and damage claims paid by the railroads in 1926 amounted to $35,785,000. This was a ratio to gross earnings of .74 per cent compared with .81 per cent in 1925. The loss and damage per car originated was reduced from 72 cents in 1925 to 67 cents last year, and the number of claims presented fell from 5.7 for each million revenue ton miles in 1925 to 5.6 in 1926. It doesn't read nearly so impressive as it figures up when millions of dollars are concerned.

No influence has been more valuable in bringing about these excellent results than have the educational meetings with shippers in every part of the country. These meetings are being continued by the freight claim division of the A. R. A. because, notwithstanding the fine results generally, one very disappointing fact still faces the workers: This is the first time in seven years that an increase has been recorded in claims for damages to less-than-carload shipments. Many such claims arise from packages breaking open in transit due to improper nailing, taping, glueing of flaps, poorly designed crates, inadequate inner packing and other causes, for which the shippers primarily are responsible. It is believed that by calling these more common causes to shippers' attention, through these educational meetings, and by exhibiting the latest ideas in container construction,

proper methods of assembling and closing containers, it may be possible to reduce these merchandise claims, practically all of which are preventable.

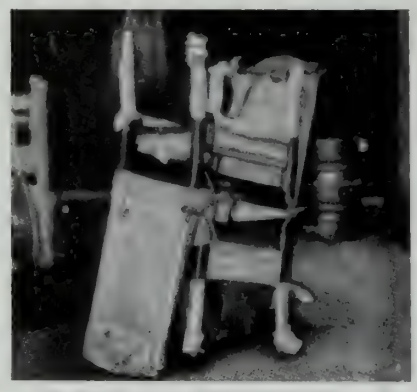
Some of the most astonishing proofs of carelessness on the part of shippers are developed in these meetings and campaigns. In the Perfect Package campaign conducted jointly by the American Railway Express Co. and American Railway Association, an analysis of reports from 1294 cities and towns covering irregularities found in bills of lading, express receipts, marking, packing, containers, at point of shipment during November, 1921, showed that just 50 per cent of all the freight errors were in the marking; 28 per cent of express errors were in marking; 57 per cent of express errors were in express receipts and 28 per cent of freight errors were concerned with the bill of lading.

Marking and billing errors are not nearly so numerous now as in 1920, when claims for lost freight cost the railroads 19 million dollars; but that they occur too frequently is evident from the report of the western weighing and inspection bureau showing that during 1926, out of 374,136 packages rejected for transportation, 273,-912 packages were rejected because of illegible or improper bills of lading. Assuming that the railroad inspection bureaus in other parts of the country found conditions the same, and considering that their inspectors saw only a small percentage of the business handled, it is plain that shipper and carrier, through individual and cooperative effort can add to the smoothness and reliability of transportation by getting together for friendly talks.

The Chamber of Commerce of the United States, at a meeting held a few years ago, passed a resolution adopting 15 principles of business conduct, fifteen fundamental truths, as it were, drawn up as practical guides for the conduct of business as a whole, and considered one of the most remarkable sets of business covenants yet devised by man. Principle Number Nine in this code says:

> Waste in any form of capital, labor, service, material or natural resources is intolerable, and constant effort should be made toward its elimination.

In this sentence the claims division found its common interest and



Improperly Tied Together Resting on Back and Two Legs.

practical basis for a meeting with business men to cut down loss and damage. It was, indeed, the fundamental reason for the existence of the American Railway Association, although no one may have put it in just those words. "The carriers," said A. L. Green, representing the claims division of the A. R. A. "are not trying to prevent the presentation of just and proper claims. If the carriers are liable they desire to pay their just debts, and pay them promptly. What we are trying to do is prevent loss of and damage to freight and obviate the necessity of presenting claims.

Chairs Properly Tied Together Rest Squarely on Four Legs.

"In the last analysis, freight claim prevention or preventing loss of and damage to freight is nothing more or less than good service. In the safe transportation of freight, the shippers are better serving their customers and the carriers are nearer to that goal they are striving for of rendering adequate service to the shipping public."

Wonderful things have been done since the real claim prevention campaign began in 1920. The loss and damage bill of the railroads in that year amounted to 119 million dollars.

It has been reduced to less than 36 millions!

It is estimated that each package of freight in merchandise service passes through the hands of at least 100 men during its trip from the packing room at point of origin to the unpacking room at destination. Should any of these men make a mistake, it may cause the shipment to be damaged, lost or delayed. You can, therefore, appreciate why both the carriers and shippers are naturally concerned in this subject and why there should be cooperation in this work. Statistics show that of the total loss and damage bill 28 per cent represents loss and 72 per cent damage. Of the damage 75 per cent is on carload shipments, of which 85 per cent are loaded and unloaded by shippers and consignees.

The American Railway Express Co., naturally, has participated energetically in all the claim prevention work. Speaking in the St. Paul convention in May, E. H. Stevens, superintendent of claims for that company, said his company knew it must have its employes with it if it hoped for success in cutting down claims. "To get and keep their interest," said Mr. Stevens, "we arranged

dinners, suppers, banquets and other meetings. We spend considerable money in educating employes and improving the personnel. We are giving every employe a vacation of a week to three weeks a year, according to length of service. It is no small item. In our central region it cost us $400,000 to hire substitute employes while regular help was taking vacations, and we are only one region of five."

It is doubtful whether many persons know as much about the American Railway Express as they know about the railroads, and that's nothing to write home about. Mr. Stevens told some rather startling things about the company in the little talk at St. Paul. This is the word picture of the activities in one city. Said Superintendent Stevens:

"It is now about 3:15 p. m. We have thousands of pick-ups to make in Chicago. We are picking up and loading 300 carloads of express in six hours in and out of Chicago. We have there 6,000 employes. Our payroll is a million dollars a month. Perhaps that will give you a little view of how big we are. We handle 180 million shipments a year. It has been said we make as many waybills as all railroad companies combined. Imagine auditing 180 million waybills, and then get 180 million abstracts to revise. We file 180 million individual delivery sheets, 540 million documents, and we keep a duplicate of every receipt issued. That is 180 million more. Possibly you get some idea of what the American Railway Express Co. is.

"And we have visions of the future. In November we entered into contract with one of the biggest manufacturers of airplanes for a fleet of flying machines. We have just started service every night from New York to Chicago, and out of Chicago every day for Dallas, Texas. That is the beginning of a transcontinental flying service. We are trying to look ahead like James J. Hill. We expect in time to fly across the country. The people want fast service, and by and by we may see a fleet of these machines flying and spelling American Railway Express, and maybe dropping packages at your door with parachutes. That is a vision for you to see."

If you still fail to register sympathetic understanding about the 36 million dollars paid out in loss and damage claims just figure out how much of a loan it would carry at 5 per cent. I never was much of a whizz at mathematics, but after getting figures all over the side of the house it seems to me that 36 million dollars would pay the interest at 5 per cent on about 750 millions. And all these claims, you know, are paid with money supplied by the dear people. Sounds silly, but it's true.

The Southwest's Freight Traffic

Somebody is always putting things end to end that never will be in any such attitude, and thereby gaining startling results. June produced one of these queer contrivances, with interesting possibilities. This is what the cheerful publicity man put over, and it's pretty good:

If the freight cars loaded with products from California, Arizona, New Mexico and Nevada since the first of the year were placed end to end, they would make a train long enough to reach from San Diego to St. Louis, to New York and around the Lindbergh air route to Paris, with enough cars left over at the head of the train to swing around the triangle to Paris, Brussels, London and back to Paris.

Resort to this statistical comparison in connection with the Lindbergh air route is made by George A. Leithner, district manager, American Railway Association, in a report made to Charles E. Virden, chairman of the Pacific Coast Transportation Advisory Board. Mr. Virden presented the figures to the delegates convened in Los Angeles in the meetings of the Pacific Coast Transportation Advisory Board, June 16-17.

In plain figures, 737,709 cars were loaded from these four western states in the first five months of the year. This tonnage is an increase of 1.7 per cent over 1926 and 9.6 per cent over 1925 for the corresponding periods.

For the coming season Mr. Virden reported that there is a surplus of 18,035 refrigerator cars on hand, and this railroad equipment generally is in better shape for this time of the year than ever before in the history of California transportation.

Safer on Railroads Than At Home

As a matter of fact, on board a railway train is about as safe a place as a person can be. Out of the thousands of policyholders of the Provident, residing throughout the United States and traveling about the country on business and pleasure, the company has not paid out during the past year a single death claim on a railway passenger. This is quite remarkable when it is taken into consideration that this Chattanooga company has been paying claims this year at the rate of 4,600 a month and during the year has returned to policyholders in claims an amount totaling more than $1,800,000.—W. C. Cartinhour, vice president, Provident Life and Accident Insurance Co., in Chattanooga (Tenn.) Times.

Good manners are the result of good thoughts. If the law of love and sympathy and justice be written in the heart of a man, he will manifest those qualities in his actions. Good manners are simply manifestations of good-will toward our fellowmen. Bad manners are the result of vanity, ill-nature, selfishness, and want of sense.

What the Papers Say

How He Made His Money

THE way I got rich is easy. I gave other men an incentive to make money for me. The men who applied all these years for jobs with me are the same men, no better and no worse than those who applied for jobs with my competitors. But I made my men work by the only process by which you can make men work hard and keep them happy, and that is how I made it possible for them to feel in cash the results of the work they were doing.—David A. Schulte.—Forbes Magazine.

It's Safer on the Railroads

A Peoria railroad man is in a hospital recovering from the effects of an accident. It was the first accident he has experienced since he started railroading 15 years ago—and the accident happened while he was walking across a street! All of which suggests that railroad employment, which used to be hazardous, is now comparatively safe—at least it is safer than crossing some street intersections at certain rush hours.

The Burlington railroad in its report for the year on its benefit department says that while in 1906 the benefits on account of accident amounted to 60 per cent, only 39 per cent was charged against accidents last year. The report also states that deaths of employes by accident while off duty caused drafts on the fund in three times as many cases last year as in 1906. Of 16 deaths of employes while off duty, ten were caused by traffic accidents.

The railroads have done more for public safety than any other industry. They started the "Safety First" campaigns which resulted in accident prevention on their own lines and in their own shops and which extended into most other industries. If the same efforts which the railroads made to prevent accidents were to be made

There Are 19 Tunnels on the S. P. & S. Ry. Between Portland and Spokane, All of the Finest Construction.

by cities and states and motorists' organizations the traffic accidents would decrease at about the same ratio which railroad accidents have decreased.—Peoria Star.

The Man Who Gets Ahead

Initiative is that quality which leads a man to do things when they should be done without being told.

The men who exercise initiative are the builders of the world—all the other people are merely tenants and janitors.

Nobody ever yet got to the head of the procession by following his competitors.

When a man with initiative cannot do a thing one way, he will do it in another.

He keeps trying; when it's time to quit he begins; when he is licked he begins fighting again.

It is well to know how; it is better to try; for by trying we learn how and we develop initiative.

The man who fails is not the man who has no gift, no chance, no pull, no training; it is the man who quits.

Success is the objective result.

Initiative is the instrument with which we win our way to success. —Metro-Cas. Bulletin.

Let the Railroads Alone

It is to the interest of business and the country in general to see the railways so firmly established as profitable enterprises that they will be able always to command the confidence of investors. To use an old figure, investors are not interested in supporting a goose that faces death every time it lays a golden egg. A raid on the railroads now would be a raid on the investors concerned; but, worse than that, it would constitute a warning to prospective investors that railway development furnished no fair and productive field for their money. Let the railways enjoy a few years of prosperity—they have waited long enough.—San Diego Tribune.

People Own the Railroads In America

Railroads are owned by the people, and when indiscriminate legislation is enacted innocent people who have invested their money in stock suffer. The impression that railroads and banks are corporations operating for the purpose of fleecing the people is purely imaginary. These corporations could not exist without the money invested by the people as a whole. The widows and orphans, the banker, the merchant and the farmer—all classes are interested in the growth and development of the railroads and banks. It is well that class prejudice has been lived

down and that railroads as well as other corporations enjoy equal treatment in the legislatures as well as in the courts of the country.—Iowa County (Mich.) News.

Evolution of the American Railroad

By Sydney E. London

A little more than one century ago the railroad industry of America represented a line only three miles in extent. The combined carrying capacity of all its rolling stock was less than that of a single modern freight car. In the space of one hundred years, a period of comparative shortness as history records time, was reared the greatest of industries—the American Railroad. Today the United States of America are linked together with a system of railroads that constitutes the most potent economic factor in the nation. Without the railroads, America would lose its unity; without its unity it would become a series of smaller nations and lose its identity.

Conceived of necessity, the railroad has shortened the vast distances of the North American continent until no longer are there isolated sections. Markets have been brought to the doors of great cities, and the products of the cities have been returned to the distant producers. Upon this activity alone rests the security of the American people. So long as a rapid and economical mode of transportation is available, America will continue to prosper.

Columbia River Cascade Mountains and Spokane, Portland & Seattle Ry. Train East of Vancouver, Washington.

Since progress is an eternal mandate, we may presume to believe that railroad development is in its infancy. One hundred years mean nothing. Visualize a hundred years hence. You will see all-metal railroad trains operated by electricity, carrying treble or quadruple their present capacity with increased speed and safety. The wasting power of our waterways will have been harnessed and electrical power will be utilized. One hundred miles an hour with safety is not unreasonable to expect. Improved roadbeds will exist and grade conditions will have been vastly improved. A speed of over 200 miles an hour already has been attained by a motor driven automobile on Datonia Beach. Yet the surface of that beach is not comparable to a ribbon of steel on which friction retardation is infinitely lessened.

What does further development of the railroads mean? It means an outlet for human effort, the building of something bigger and better for humanity. It is the endless cycle of an infinite power expressing itself through mankind. The urge is to create better things. In the creating mankind grows. The railroads will feel this infinite touch. Mankind will awaken again some day in the future and look back upon the progress that has been made. Again it will ponder and feebly prophesy the unfoldment of the future years.

View From Bear Mountain Bridge, Hudson River, Along the New York Central Lines.

What Does This Mean To You?

"When she goes by jump on her, cut her in two and bring her head in here to the station."

"Tell the knowledge box what you're doin', then shuffle 'em up."

"Hitch a mill kettle and a dog-

house and take Queen Marie 50 miles north."

That is a selection from one of the nationally known trade dialects that have become part of the American language. If you can talk "railroad" it will be as clear as Webster to you; otherwise you must start at the beginning with a "key."

The "key" goes this way: "She" is a train of cars; "her head" is the engine and cars immediately adjoining it; the "knowledge box" is the switchman's house; "shuffle 'em up" is an order to sort freight cars in their proper divisions; a "doghouse" is a caboose; Queen Marie is the yard workers' name for an emergency crew so christened because of the easy nature of the work. — Philadelphia Public Ledger.

College Men Discuss Railroading

When the guests who were to grace the speakers table at the Pacific Railway club at its tenth annual meeting assembled at the Fairmont hotel, San Francisco, recently, it was discovered that six of the seven were University of California alumni, and that the seventh has been a member of the U. C. board of regents and chairman of its finance committee for a great many years.

The club's guest of honor and principal speaker, W. B. Storey, president of the Santa Fe, is a civil engineering graduate of the university at Berkeley, and holds the honorary degree of Doctor of Laws which was conferred upon him on commencement day two years ago. The others were: Warren S. Palmer, president of the Northwestern Pacific R.R. Co., who was graduated at the age of 18 from the engineering college, and still holds the record as this college's youngest graduate; Lester S. Ready, president of the Key System Transit Co., and F. L. Burckhalter, first assistant general manager of the Southern Pacific Co., also graduates of the civil engineering college, as is President W. W. Campbell of the university who was at the speakers table. F. M. Angellotti, chief counsel of the Western Pacific R. R. Co. and a former justice of the state supreme court, is a graduate of the Hastings College of Law, a branch of the university. The guest, who is not a Berkeley graduate but is one of the board of regents, is William H. Crocker, president of the Crocker First National Bank, a close friend of Mr. Storey's.

The Little Red Caboose

Over the hill at Libertyville
With a jingle of gearing loose,
Comes "48", the long way freight,
And the little red caboose.

Way up in front where he bears the brunt
Of the sleet and the swirling snow,
Old Mogul Horse plods his weary course,
Steady and strong, though slow.

With a rattle of slack bumping down the track
"48" takes the siding clear—
While Number 4, with a deafening roar,
Whistles by in her mad career.

On stormy nights when lights are bright,
And hearts full of indoor fun,
From the midst of joys, give a thought to the boys
On that cold and dreary run.

With jolts and jars on the swaying cars,
They're bucking the ceaseless grind,
While a twinkling light laughs at the night
From the little caboose behind.

God grant that they have right of way
With a meet or a pass for all,
Till the home-yard light with a welcome bright
Flashes the last "high-ball."

—J. N. Stewart,
V. P. & T. M. Wilmington Transp'n. Co.

Service Costs Money

Everybody who reasons knows that he cannot have satisfactory service if the company from which he buys that service is impoverished. He does not get good gas or electric service from a public service company that is prevented by rates that are too low from doing business at a profit. He does not get comfortable or decent transportation from a street car company that is not permitted to make money.

Similarly, he does not get and ought not to expect good service from a railroad company that is not permitted to earn an adequate revenue. He does not get it in his every day service and he does not get it in the long run of the needs of commerce, in proper extensions of line and additions to equipment.

So, aside from all question of fairness to the men who have put their money into transportation service, out of mere selfishness everybody should desire that the railroads from which he buys transportation be prosperous. — The Traffic World.

The Railroads are Rejuvenated He Says

The department of commerce at Washington has compiled some statistics on the railroad situation in this country that are both significant and interesting.

Car loadings have increased in the last half decade from 42,000,000 cars a year to 52,000,000. The average train now carries 752 tons against an average load of 687 tons five years ago. The average freight car traveled 24.4 miles a day in 1921; this year the average car-miles per day is 29.5. The revenue freight ton-miles handled by each railroad employe have grown from 214,667 to 264,152. And this improvement in railroad business and efficiency has been accompanied by a reduction in freight rates and number of railroad employes.

Herbert C. Hoover, secretary of commerce, observes that "probably the most outstanding single industrial accomplishment since the war has been the reorganization of our American railways.— Hammond (Ind.) Times.

Urging everyone to vote sounds pretty good, but when we see some of the yaps whose votes are as effective as ours, well, we wonder over the wisdom of it.

Queer Things That Happened in June

THANK goodness, something has been found—one form of transportation—a public utility, too, which the state government can not regulate, one utility which the railroad commission can not tell to "head in" at some particular place. Horse-drawn sleighs.

The California commission gave the decision, one day in June at Sacramento. It declined to assume parental authority over Lake Tahoe sleigh rides.

W. B. Gelatte asked to be allowed to sell a passenger and freight service between Donner Lake Camp and Truckee to the Sierra Nevada Stages, using automobiles in summer and sleighs in winter.

"You have our permission as far as the automobiles are concerned, but sleighs were before our day, we can't regulate those," the commission ruled.

A Fire in the Subway

A trolley wire broke one day on a Hollywood car passing through the subway, the roof caught fire, and within 30 seconds passengers were fleeing pell-mell through the darkness as if they expected to meet Lindbergh. The damage didn't amount to over $50 and the delay was brief, but such is the peculiar effect of fear upon some persons, especially in a tunnel, reports circulated down town had women fainting and men in a panic.

All of which the Pacific Electric officials promptly denied, and there you are.

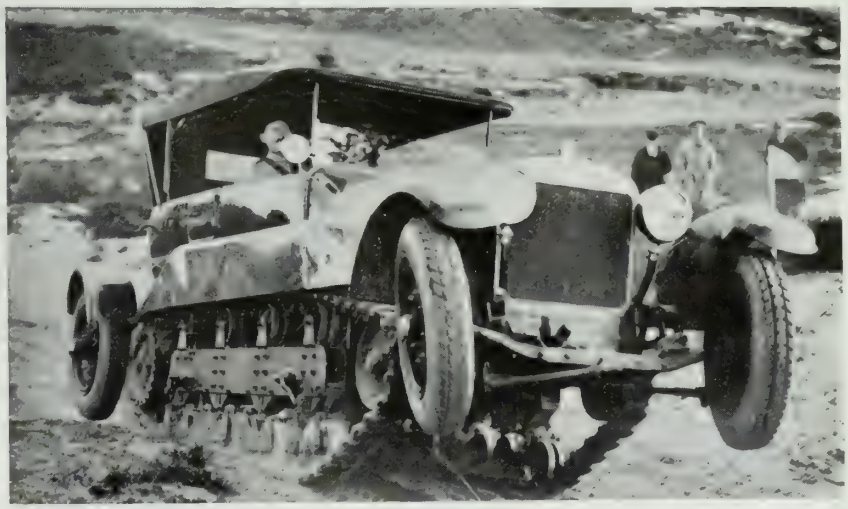
Worth Remembering

President Coolidge gave out a few words about economy in June.

"Economy," said the President, "does not mean the neglect of essentials. It gives the added protection which comes from the means to meet a time of emergency.

"The federal government has set an example not alone to the other governments in this country but to other nations in the practice of economy.

"Extravagance may bring momentary pleasure and apparent benefit, but it creates a condition which is bound to affect the future adversely. In our operations we are building for more than the present. The foundation is being well laid with a support of the people in which we find encouragement to continue efforts in their behalf."



—Herbert Photos.

One of the "Nightmare Mobiles," a Caterpillar Tractor-Motor Car Adopted by the British Army for Traveling Over Bad Roads. A War Engine of Great Power.

But Not in State Taxes

There will be another swipe at taxes next winter, President Coolidge has announced. But this, of course, refers to federal taxes—not state. Every time the astute politicians begin to wonder whether Mr. Coolidge can be re-elected, out comes a casual statement to the effect that taxes are to be reduced, and the Democrats grind their teeth. Meanwhile the railroads continue to give up more than a million a day in taxes.

Now, If the Engineer Should Resign

Word came from Yreka, Cal., June 18, that Bob Strycker had quit. Bob was the conductor on the short line railroad running now and then between that town and Montague, and when he turned in his badge and key and his rusty punch it looked as if the property would have to be shut down. Bob has been running the train on this short line for seven years, seven long years, the reporter said, and he just couldn't stand it any longer. At least that's what he told the reporter. Things were too deadly dull on his road, especially since practically everyone in the country owned a Ford or an automobile, or used the buses and trucks, and the railroad didn't have enough traffic to keep the conductor interested.

So what did Bob do but up and quit. And where did he go? He "accepted a position" according to the afore-mentioned reporter, as sexton for Evergreen cemetery

near Yreka where there's always some new undertaking in view. And if that isn't a dirty dig at something or other then we don't know railroading.

A Bus College on Tour

The "Southwestern college on Wheels," a cousin of the University Afloat, will set out from Winfield, Kas., July 9 to visit 22 states, as well as two provinces of Canada. Transportation will be provided by a 24-passenger parlor bus and four seven-passenger motor cars. The students will camp, using pup tents and air mattresses.

Forty-five students representing five states will make up the party, which will be in charge of Dr. William M. Goldsmith, head of the biology department of Southwestern college, Winfield. Food will be prepared under the supervision of Mrs. Goldsmith, who is head of the home economics department of the college.

For Misplacing His Heart $25,000

Charging that his heart had been misplaced in a crossing crash, Victor Fowler Thompson of Pleasantville, N. J., was awarded $25,000 damages by a jury June 20 in a supreme court action against the West Jersey & Seashore R. R. and the Atlantic City & Shore R. R. Thompson had asked $50,000.

Dr. James Morgan, Philadelphia, corroborated Thompson's claim that his heart had been pushed over to one side from its normal position.

Now Labor's In the Air

Workmen of various crafts going to and from their jobs in their own motor cars has become a common enough sight in American cities, which English labor has found it difficult to believe, but now the crafts have taken to the air. And not as joy-riders, either. Two carpenters living at Santa Ana, Cal., S. L. Shoemaker and Charles Nelson, fly to and from their work at San Clemente every day. The plane is piloted by Shoemaker, who has a pilot's certificate issued by the National Aeronautic Association. He had his first flying experience at March Field, near Riverside, when he was a member of the aviation corps. "The ride makes both of us feel more like doing a day's work than if we made the trip by automobile," Shoemaker said. "After we quit work in the evening, we soar through the clouds and are home again in just a few minutes."

Train Blown From Track

A terrific gale in the Austrian Alps recently blew six passenger cars and a baggage car of a local train off the track between Bregenz and Bezau. Two passengers were injured. This unique accident occurred when the train had been stopped to repair the roof of one of the coaches which had been partly ripped off by the wind.

Likes Harvey Meals

Every day at 4:05 p. m. a shaggy-coated black and white setter makes a point for the kitchen-end of the diner when train 106 stops at Amory, Miss., and sits with a look of expectancy upon his intelligent old face until the door opens and the chef hands him his supper. This is no common beggar dog, but an epicure who has learned to appreciate the quality of Fred Harvey dining service.—Frisco Magazine.

For a Tow Now $2

Up in Minnesota where it rains occasionally, at Fairmont, the farmers have organized—farmers seem to be eternally organizing for something or other—and have established union rates for hauling motorists through mud holes and out of them. For hauling a vehicle through the mud the charge is $1. If the motorist wants to take the risk and fails in his chance to get through, the charge will be $2. Farmers say the extra work of fixing tackle and the harder pull is worth the extra dollar.

Boys Will Be Boys, You Know

Poor marksmanship of three boys who stole eight sticks of dynamite, and then tried to toss them into the smokestacks of passing Illinois Central passenger trains at Chicago, June 27, probably saved the lives of many persons.

The boys, Michael Rizzo, 14; Dante Falco, 12, and Carl Laphen, 12, took the dynamite from the war show at Soldiers' Field, broke the sticks into quarters, stationed themselves on a foot-bridge over the tracks and dropped piece after piece of the explosive toward the trains' smokestacks. All were wide of the mark.

Tiring of this pastime, they lighted a fire, placing a stick of dynamite in it. Thinking it was not going to explode, Rizzo attempted to remove it. His hand was torn off.

The police recovered 16 broken sticks of dynamite on the railroad right of way.

Engineer Saves a Baby

When L. L. Hillier and his wife went calling the other evening in Ventura, they left their two-year old daughter asleep in the car in front of the house in which they were visiting. Evidently the baby awoke after a while and started out to hunt for her parents.

Southern Pacific fast passenger train number 78, eastbound, and due at Ventura at 8:17 p.m. was approaching the city with its usual speed. Just inside the city limits Engineer Edward Seymour of Los Angeles, looking down the beams of light from his engine saw a little white bundle between the rails not far ahead. Air brakes stopped the train just about one engine length away from the baby, still sleeping. Conductor Spear took her aboard the train and on to

town nearly a mile away. There she was delivered to the station agent who notified the police. The coppers took the baby to the county hospital, lacking any better place, and as a two-year old child cannot tell very much about her street address or parents, there she stayed until late that night when the parents traced her through the police.

Hand Car Speeder Fined

Not far out of Oakland, a few days ago, Wilbur Hampton, a railroad employe was late to work. He commandeered a handcar, placed it on the Western Pacific tracks and started toward the company's central offices. Everything was going fine until a traffic officer hauled him down for crossing an intersection against a signal.

"What a fine trick that was," said Police Judge Bacon, "That deserves fine recognition—it'll be $2."

Saved by the Porter

Anthony Wingerter, 71 years of age, of St. Louis, might have been swindled out of $9000, his liftime savings, but for the alertness of a porter.

When Santa Fe train No. 11 pulled into Richmond, Cal., the other morning, police arrested William Wilson, said to be a bunco man, who had accompanied Wingerter from Los Angeles.

The porter informed police that Wilson had been teaching the old man to "play the horses," in Long Beach. Fake wires had been used as bait. The old man had won several times with the subsequent plan to relieve him of his entire bank roll in San Francisco.

Lowest and Slowest Locomotive

The Baldwin-Westinghouse mine locomotives exhibited at the American Mining Congress represent the most modern trends in the development of haulage and gathering types of motive power. The four-ton gathering locomotive is the lowest and slowest of this type ever built, and meets the demand for motive power for working thin seams, having an overall height of 23 5-16 inches and speeds of two and one-quarter miles an hour when operating from conductor cable and six miles an hour when operating from the trolley. Some of the features of its design include semi-magnetic control, barsteel frames, self-equalizing coil springs, spacious accommodations for motorman, ball bearing motors, vertical type cable reel, new type resistor and other standard practices embodied in the construction of Baldwin-Westinghouse mine locomotives.

Saving the Railroad Dollar

By W. P. Dolan

"Mony a mickle makes a muckle," say the thrifty Scotch. Poor Richard puts it another way: a penny saved is a penny earned. But my theme "Saving the Dollar" should have a greater appeal to the average railroad man than the humble penny.

All right thinking men abhor waste. It is the unforgivable sin in any going business. Considering the effort expended in earning the railroad dollar and the cost of that effort as measured in dollars and cents, isn't it strange that there are so many who give little or no thought to saving it?

But, you may say, there is no opportunity for me to save. Are you sure? Opportunities are all around us, greater perhaps in branches of the service where expenditures are heaviest, but existent, even plentiful, everywhere. In some quarters, the possibilities are boundless. Men with vision see these things, but others will see them only when the way has been pointed out and their interest aroused. The agent who takes pride in keeping per diem down, and who watches foreign cars to see that they are not unnecessarily delayed, can save many dollars; the engineer who conserves fuel and who is interested enough in his job to make such temporary repairs to his engine in time of trouble as will enable him to bring his train into terminal on, or close to schedule, can do likewise; and the car repairer who at intermediate terminals makes minor repairs to cars in trains, thus saving delay, switching and fuel, has frequent occasion to save the dollar; the chief dispatcher who keeps an eye on helper service, and who by proper planning avoids "short-day" extras when other trains can handle the business, by avoiding long initial delays at terminals with their needless waste of fuel and overtime, has an almost unlimited field for saving; the section man, who sees to it that new ties are not put in track where secondhand ties should go, can do his part. In the issuance of fuel, material and supplies; in the safeguarding of railroad property, in the reclaiming of scrap, and countless other avenues, employes, no matter in what department nor in what capacity they may be employed, can render a signal service to their employer.

A saved dollar is a bigger and a better dollar than an earned one. Why? Because if it costs 70 or 80 cents to earn a dollar, its net worth is but 20 or 30 cents, while one saved is a full 100-cent dollar. Think it over!

The primary purpose of a transportation company is to pay dividends to its stockholders. Saving the dollar will keep the strong-box filled, and a well filled strong box insures prosperity, in which the employe inevitably shares.

We have plenty of spenders. We need more savers. Some one has said "Opportunity knocks but once," but the opportunity to save is never lost while life lasts. Right-thinking men abhor waste. Let us think right, and save the dollar.

Though flattery blossoms like friendship, there is a vast difference in the fruit.—Socrates.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

Increased Speed in Freight Traffic

ACCORDING to the bureau of railway economics the railroads are handling the freight traffic now being offered them with the greatest speed ever reported for this season of the year. The average daily movement per car in April, was 29.5 miles a day, the highest average for that month ever attained since the compilation of reports started in 1917. The daily average for April was an increase of one-half of a mile above that for April, last year, and an increase of 2.9 miles above the average for April, 1925. In computing the average daily movement, account is taken of all freight cars in service, including those in transit, in process of being loaded or unloaded, undergoing or awaiting repairs, and cars on side tracks for which no load is immediately available. The average car load in April, was 26.2 tons, an increase of one-tenth of a ton compared with the average for April, 1926, and an increase of three-tenths of a ton compared with April, 1925. It also was an increase above the average for April, 1922 and 1924, but was a decrease compared with 1920 and 1923.

To Land Passengers by Airplane

A cablegram is said to have been received from the Ile de France, the new boat of the French line, while making its recent maiden voyage to the states, saying that after the liner has made several trips seaplanes will be carried and passengers taken from the boat when off the grand banks and landed at various seaports in the United States and Canada.

I. C. C. to Report on Buses

The Interstate Commerce Commission expects to complete its report on the operation of buses and motor trucks by, or in connection or competition with, common carriers subject to the Interstate Commerce Act in time to submit it to congress at the opening of the next regular session, according to Chairman Esch. The investigation was originally ordered by the commission on its own motion on May 21, 1926. The scope of the investigation includes "the legality and propriety of the arrangements under which buses and trucks are operated; the rates, fares and charges for such services, and the provisions for filing schedules thereof, and the extent to which the traffic and revenue of carriers subject to the act are affected by the operation of motor buses and trucks."

Radio for Street Cars

The federal radio commission does not look with favor on the granting of broadcasting licenses to electric railways where the principal purpose is to provide entertainment for the passengers on their cars. The feeling of the commission is that this service can be provided effectively by "wired wireless" without further congesting the air. Serious consideration is being given the installation of loud speakers in the cars of electric railways in several cities.

C. & N. W. to Spend $400,000 on Bridges

The Chicago & North Western has awarded the following contracts involving the expenditure of about $200,000 for concrete piers and abutments for the bridge betterment program of 1927: For the Wyoming and Black Hills divisions, to Peppard & Burrill, Minneapolis; for the Madison division, to Duffy-Jutton Co., Milwaukee; for the Peninsula, Lake Shore and Ashland divisions, to the Adrian Construction Co., Green Bay, Wis.; for the Southern Illinois division, to S. G. Cool, Chicago; for the Iowa division, to Gaffin & Gehri, Fond du Lac; for the Minnesota division, to the Widell Co., Mankato, Minn. Including steel, which will be placed by the company forces, these bridge replacements will cost approximately $400,000.

The Philadelphia Subway

Bids for extending the South Broad street subway of Philadelphia were called for June 10 by Henry E. Ehlers, director of the city transit department, in whose office they will be opened on July 19. Unofficial estimates place the cost at $20,000,000. The specifications call for a continuation of traffic throughout the subway construction. Laying of rails, installation of electrical equipment and repaving of South Broad street are not included in the construction contract. Transit department engineers estimate that there are 372,000 cu.yd. of excavation, 54,000 cu.yd. of concrete, 11,700,000 lb. of structural steel, 1,400,000 lb. of reinforcing steel and about 1,200 tons of cast-iron pipe included in the contract. A contract has recently been let to the Union Switch & Signal Co., Swissvale, Pa., covering the complete installation of automatic block signaling, electro-pneumatic interlockings, and automatic train stop equipment in the new Broad street subway.

St. Paul Hearing Postponed

Hearings before the I. C. C. on the reorganization plan for the St. Paul, scheduled to begin June 16, were postponed to July 6. Proposals put forward to terminate the receivership on the road have been contested by a bond holders' committee.

Consolidation of Ferries

Consolidation of the transbay lines of the Southern Pacific and Key System under one management and abandonment of duplicated facilities in the east bay were recommended by J. G. Hunter, transportation engineer of the state railroad commission.

An annual saving of $500,000 in operation expenses of the transportation companies would be effected by their merger, the commission engineer estimates.

"It is quite apparent," declares Hunter's report, "that considerable saving in the operating expenses of these two companies could be realized by the elimination of duplication of service. Such elimination might be effected by dividing the district between the companies on some equitable basis or through the consolidation of the two systems, to be operated by either of the two existing companies or by the formation of an independent operating company.

New Railroad Authorized in Utah

A certificate of convenience and necessity, permitting it to operate as a common carrier by rail and by stage between Ogden, Utah, and the Utah-Idaho state line and intermediate points, has been issued to the Utah-Idaho Central R.R. by the public utilities commission of Utah. The company has also been granted permission to operate a bus line for the transportation of passengers over the streets of Logan, Utah. All the rights and privileges formerly

enjoyed by the old Utah-Idaho Central Co. have been granted to the Utah-Idaho Central R.R. in the certificate.

Abandonment of Electric Line

The Evansville & Ohio Valley Ry., Evansville, Ind., has requested permission from the Indiana public service commission to abandon its interurban line between Evansville and Mount Vernon. In the petition the company declares it will provide for a number of passenger and freight vehicles sufficient to accommodate a volume of business equal to that which it now has. In its petition the company points out that the Indiana State Highway connects these points and that it almost parallels the railway line. The Mount Vernon Line has been operated since 1905.

S. P. May Earnings Increase

The net railway operating revenues of the Southern Pacific for May were $3,822,466, an increase over the corresponding period last year of $443,450. This brings the net operating income for the first five months of 1927 up to $15,177,421, a gain of $984,979 over the figures of 1926.

Electric Car Loading Increased

The Chicago, Aurora & Elgin R.R., by a new plan of operation, has brought about faster handling of carload freight traffic, affording substantial economies in operation, including a reduction in per diem costs for foreign line cars on its rails. Based on the experience of the first month's working of the new plan an annual saving of approximately $30,000 is estimated by company officials. On Feb. 1 last, a car service section of the transportation department was established at Wheaton, Ill. Since that time the average number of car-miles a day has increased some 29 per cent, compared with a similar period of 1926, resulting in a more expeditious movement of carload freight and permitting more efficient utilization of existing facilities. The ratio of empty freight car miles to total freight car miles has been lowered from 56 per cent to 33 per cent, incidentally reducing proportionately the operating cost of handling cars in non-revenue movement.

Great Northern-N. P. Consolidation

The plan for the unification of the Great Northern and Northern Pacific has been declared operative by the deposit committee, it was announced in New York on June 19. The committee also has approved the making of application to the Interstate Commerce Commission for its approval of the acquisition of control by the Great Northern Pacific Railway Co., a new Delaware corporation, of the two northern companies and the Spokane, Portland & Seattle. The plan as announced provides for the acquisition of the stock of the Great Northern and Northern Pacific by exchanging stock in the new company on a share-for-share basis. The new company also will take over leases of the Spokane, Portland & Seattle and roads controlled by the two northern companies. Deposits of 70 per cent of the outstanding stock of the northern companies have been made under the unification plan.

I. C. C. Reports on Rock Island Lease

The proposal of the Rock Island to abandon operating rights over the Denver & Rio Grande Western between Denver and Pueblo should be taken into the courts for adjustment, the I. C. C. was advised on June 22 by its examiners. The Rock Island is now required to pay to the Rio Grande an annual rental which has averaged $345,000 for the use of 84 miles of line. Since 1918, however, the Rock Island has made but little use of the Rio Grande rails and it now desires to cease using the Rio Grande terminals in Denver and Colorado Springs. While the examiners concluded that the rental was too high, the commission was told that the contract should be passed upon by courts rather than by the commission. At the same time it was recommended to the commission that the Rock Island be permitted to abandon use of the Rio Grande terminals in Denver and Colorado Springs whenever it had made arrangements for other facilities.

Railroads Earn 4.36 Per Cent in April

Class I railroads had a net railway operating income in April of $73,627,248, which for that month was at the annual rate of return of 4.36 per cent on their property investment, according to reports just filed by the carriers with the bureau of railway economics. In April, 1926, their net railway operating income was $75,881,708 or 4.61 per cent on their property investment. Property investment is the value of road and equipment as shown by the books of the railways, including materials, supplies and cash. The net railway operating income is what is left after the payment of operating expenses, taxes and equipment rentals but before interest and other fixed charges are paid. This compilation as to earnings in April is based on reports from 183 Class I railroads representing a total mileage of 238,187 miles.

Gross operating revenues for April amounted to $498,427,865 compared with $500,489,191 in April, 1926, or a decrease of four-tenths of one per cent. Operating expenses in April totaled $384,667,987 compared with $385,783,021 in the same month in 1926 or a decrease of three-tenths of one per cent. Class I railroads, in April, paid $30,390,190 in taxes. This brought the total tax bill of the Class I railroads for the first four months in 1927 to $119,481,917, an increase of $947,380, or eight-tenths of one per cent above the corresponding period in 1926. Thirty-four Class I railroads operated at a loss in April, of which 14 were in the eastern district, three in the southern and 17 in the western district. Class I railroads for the first four months in 1927 had a net railway operating income amounting to $299,964,211 which was at the annual rate of return of 4.63 per cent on their property investment. During the corresponding period of the preceding year, their net railway operating income amounted to $299,850,537, or 4.75 per cent on their property investment. Gross operating revenues for the first four months in 1927 amounted to $1,985,746,338 compared with $1,974,741,994 during the corresponding period in 1926 or an increase of six-tenths of one per cent. Operating expenses for the first four months period of 1927 totaled $1,529,253,575 compared with $1,523,204,210 during the corresponding period the year before or an increase of four-tenths of one per cent.

Because of the fact that railway business and earnings fluctuate from year to year, only the showing of results over a period of years can indicate the real trend of railway returns. The rate of return on property investment for the five years ending with April, 1927, has averaged 4.54 per cent.

Floods Didn't Damage the S. P.

On June 18, H. M. Lull, executive vice-president of the Southern Pacific lines in Texas and Louisiana, issued the following statement regarding the recent floods:

"Southern Pacific main line through southern Louisiana connecting New Orleans with Texas and with the West and middlewest has been unimpaired by flood waters of the Mississippi and in the Atchafalaya Basin, and has been in continuous operation under practically normal conditions throughout the entire period of high water, handling not only its own traffic but also the freight and passenger traffic of several other railroads whose service is interrupted by flood conditions. The crest of the flood on both the Mississippi and Atchafalaya has now passed the Southern Pacific main line, and the waters are receding. Owing to protective measures taken in advance of high water the track and roadbed remain in first class

condition, and all traffic is being handled over it on normal schedules and without delays. In addition to its regular freight and passenger service this company has performed large service over a period of the past 30 days in assisting the Red Cross in evacuating thousands of refugees from flooded areas as well as hundreds of carloads of household goods and livestock. It is expected that flood waters will continue to recede, and that by the end of June a large portion of the submerged cultivated areas in the Atchafalaya Basin and adjoining the Southern Pacific will be out of the water and in condition to permit planting of late crops."

Greatest Freight Traffic in History

Freight traffic handled by the Class I railroads in April amounted to 37,101,687,000 net ton miles, according to reports filed by the carriers with the bureau of railway economics. This was an increase of 801,527,000 net ton miles or 2.2 per cent over the corresponding month of last year and an increase of 3,530,924,000 ton miles or 10.5 per cent over April, 1925. In the eastern district, an increase of 3.3 per cent in the volume of freight handled was reported compared with the same month last year while the southern district reported an increase of six-tenths of one per cent. The western district showed an increase of 1.3 per cent. Freight traffic for the first four months this year amounted to 155,394,137,000 net ton miles, the greatest ever reported for that period in the history of the railroads. This was an increase of 7,344,679,000 net ton miles or five per cent over the best previous record established during the corresponding period in 1926. It also was an increase of six per cent in the amount of freight handled by the railroads in the first four months compared with the corresponding period the year before but the southern district reported a decrease of one-half of one per cent. In the western district, an increase of 5.9 per cent was reported.

Southern Pacific Ferries

Shipping enough to move 27,900 passengers and 950 automobiles in a single excursion is represented in the Southern Pacific's San Francisco Bay fleet of 20 ferries, according to Capt. Charles F. Heath, superintendent of the company's steamer division. "During the past 20 years," Heath said, "these ferries have transported approximately 474 million passengers across the bay under all weather conditions without loss of life or serious injury due to accident to the boats. The fleet is operated by a deck force of 150 officers and 400 men and an engine room force of 110 officers and 172 men, each vessel being manned either by a double or triple crew."

Steamship Lines Oppose Rate Cut

Steamship lines using the Panama Canal protested a reduction by railroads of 15 cents a hundred weight on the rate of canned goods from the Pacific Coast to the Atlantic at a hearing before the I. C. C. in Chicago on June 21, The steamship companies said the reduction in the rate from $1.05 to 90 cents eliminated them from competition.

Train Control on Pennsylvania

On July 1 the new system of train control installed on the Panhandle division of the Pennsylvania between Pittsburgh and Newark started operation. This is the third division to be put into operation, and the road expects to have the two additional divisions now being equipped ready for operation before long. The system being used is manufactured by the Union Switch & Signal Company.

C. & O. Earnings for May

The gross revenues, net railway operating income and net income of the Chesapeake & Ohio with operating ratio are shown in the statement of operations for May, 1927. Gross revenues for the month were $11,670,381, an increase of $651,632 over May, last year; operating expenses were $7,865,332, an increase of $457,444 as compared with May, last year; net railway operating income is $3,281,960, a decrease of $59,762 over May, last year. The net income after all charges for May, 1927, was $2,606,519, a decrease of $28,530 over May last year. The operating ratio is 67.4 per cent compared with 67.2 per cent for May, last year, or an increase of .2 per cent. For the five months ended May 31, 1927, the road shows gross revenues of $55,793,665, an increase of $4,859,460; operating expenses were $38,151,730, an increase of $1,163,232; net railway operating income was $14,855,231, an increase of $2,574,400. The net income after all charges is $11,465,982, an increase of $2,493,769 compared with corresponding period of 1926. The operating ratio for the period is 68.4 per cent, a decrease of 4.2 per cent over the same period a year ago.

Revenue Freight Loads Continue Above Million

Loading of revenue freight for the week ended June 18 amounted to 1,016,351 cars, according to reports filed by the carriers with the car service division of the American Railway Association. This was a decrease of 11,954 cars under the preceding week, reductions being reported in the loading of all commodities with the exception of merchandise and less than carload lot freight which showed a slight increase. Compared with the same week last year, the total for the week of June 18 was a decrease of 20 292 cars but was an increase of 31,768 cars over that week in 1925.

Miscellaneous freight loading for the week of June 18 totaled 392,554 cars, an increase of 10,297 cars over the same week last year and 25,016 cars over the same week in 1925. Loading of merchandise and less than carload lot freight for the week totaled 258,439 cars, a decrease of 1,111 cars under the same week last year but 218 cars over that week two years ago. Coal amounted to 156,046 cars, a decrease of 18,797 cars under the same week last year, but an increase of 931 cars compared with the same period two years ago. Grain and grain products totaled 38,566 cars, an increase of 440 cars over the same week in 1926 and 3,141 cars above the same period in 1925. In the western district alone, grain and grain products totaled 24,612 cars, an increase of 1,497 cars above the same week last year. Live stock amounted to 25,832 cars, a decrease of 1,354 cars under the same week last year but 293 cars above the same week in 1925. In the western district alone, live stock loading totaled 19,426 cars, a decrease of 1,398 cars under the same week last year. Forest products totaled 69,402 cars, 5,735 cars below the same week last year and 2,380 cars under the same week in 1925. Ore totaled 65,137 cars, 3,037 cars below the same week in 1926 but 3,521 cars above the same period two years ago. Coke amounted to 10,375 cars, a decrease of 995 cars under the same week in 1926 but 1,028 cars above the same period in 1925. All districts reported decreases in the total loading of all commodities compared with the same period in 1926 except the Pocahontas, southern and northwestern but all reported increases, except the central western and southwestern compared with the same period in 1925.

Foreign Aeronautical News

The development of aviation all over the world is constantly taking on new impetus. Among some of the news items of the month the following are of interest: The Societe Anonyme Belge de Constructions Aeronautiques has issued a statement in Brussels showing it has assets of some 14,000,000 francs and liabilities including capital stock of 10,000,000 francs, and a profit on last year's operations of approximately 1,000,000 francs. During the year the company built a factory for turning out all-metal

airplanes. The government recently placed an order with the company for 3,000,000 francs worth of planes. The total output of the company for the year is valued at about 14,000,000 francs. It has recently secured a license to manufacture the British Jupiter air-cooled motor.

Under the auspices of the Danish Aeronautic Society an International aircraft exhibition will be held in Copenhagen from August 20 to September 2.

A total of 523,122 kilometers were flown during the calendar year 1926, over the 3,957 kilometers of aerial lines operated in Italy. The number of flying hours totaled 3,524, 3,991 passengers were carried, 1,571 metric tons of mail and 40,907 tons of merchandise and baggage were transported.

The Polish League for Aerial Defense gave an aviation exhibit at Warsaw in May. The league now has about 300,000 members and with government assistance conducts schools for pilots and mechanics, provides scholarships for aviation students studying abroad and seeks to educate the Polish population in aviation matters by widespread propaganda, including printed matter, lectures and exhibits. The league has also constructed airdromes at Kotowice, Lodz, Luck and Vilna, and financed the flight of Capt. Orlinski to Tokio and return.

Reports from the recent international aero-transport congress in Vienna, (at which the question of suitable air routes, as well as rates for transportation of passengers and mail, was discussed by representatives of 12 European nations) state, that new air lines will be opened this summer between Stockholm and Warsaw and from Oslo to Copenhagen along the west coast of Sweden, touching Goteborg and Malmo. When the lines are ready it will be possible to travel from Stockholm to Helsingfors, Berlin or Warsaw, and from Malmo to Vienna, Prague, Dresden, Berlin, Hamburg, Munich, Zurich, Paris, London, Brussels, Amsterdam or Breslau in one day or less.

The Polish Aerlot Co. during April made 335 flights for a total distance of 84,213 kilometers and carried 744 passengers, 22,500 kilos of freight and 52.3 kilos of mail. All figures except mail showed a substantial increase over March. The lines operated by this company extend from Warsaw to Cracow, Warsaw to Lodz, Warsaw to Lemberg, Warsaw to Danzig, Cracow to Lemberg, and Cracow to Vienna.

Five Railroads Plan Air Lines

Five large railroad companies are considering supplementing their rail passenger service with air passenger service. William P. MacCracken, Jr., assistant secretary of commerce for aviation, declared, July 6.

"Five large railroad companies have been in conference with me for some time considering supplementing their rail passenger service with air passenger service," MacCracken said.

"None of the lines have actually completed arrangements for such service, but I have little doubt but what marked progress in that direction will be made within a year."

A Hose Connector Questionnaire

The A. R. A. has appointed the following railway officials as a committee to investigate automatic hose connectors: R. L. Kleine, Pennsylvania Railroad; F. Walters, Chicago & North Western; C. E. Chambers, Central of New Jersey; G. H. Wood, Santa Fe; C. E. Denney, Nickel Plate. A questionnaire will be sent to the railroads for data.

Railway Construction

Tracks and Yards

ALABAMA.—See item about St. Louis-San Francisco under Mississippi.

CALIFORNIA.—The Southern Pacific Pacific has started construction on a new 61-mile line, connecting Cornell, Siskiyou county, with Alturas, a point on the California, Nevada & Oregon R.R. The only stations contemplated on the new line are Cornell, Canby and Alturas. When the line is completed it will give the Southern Pacific, which controls the Central Pacific, a through line north from San Francisco into central Oregon.

CANADA.—The Canadian National has awarded a contract to the Cooke Construction Co., Montreal, for grading an extension of line from St. Felicien, Que., to Mistassini, 27.5 miles. The estimated cost, $1,463,000, includes the construction of bridges over the Ashuapmouchouan and Ticouabe Rivers.

—The Canadian Pacific has awarded a contract to W. A. Dutton, Winnipeg, for grading extensions of line from Asquith, Sask., northwest 20 miles, and from Rosetown, Sask., northeast 21 miles. Other contracts have been awarded to Roosa & Wickstrand, Winnipeg, for grading an extension from Cutknife, Sask., to Whitford Lake, 66 miles, to the Commercial Cartage Co., Calgary, Alta., for grading an extension from Cassils, Alta., south 22 miles.

FLORIDA.—The I. C. C. has granted an extension of time to November 1 for the completion of the Seaboard-All Florida line from West Palm Beach to Florida City.

GEORGIA.—The Nashville, Chattanooga & St. Louis has begun work on the new tunnel 50 feet north of the old tunnel at Tunnel Hill. The tunnel now in use was built when equipment was much smaller than it is today.

KENTUCKY.—The Louisville & Nashville has been authorized to construct a new line from Chevrolet to Hagans, Va., 13.87 miles, and the operation under trackage rights of a line of the Interstate Railroad from a point near Norton to Miller Yard, about 18 miles, to connect the eastern Kentucky division of the L. & N. with the line of the Carolina, Clinchfield & Ohio. The new line is a compliance in part with a condition imposed by the commission in connection with its authorization of a lease of the C. C. & O. by the Atlantic Coast Line and the L. & N. The estimated cost is $5,287,000.

MASSACHUSETTS.—The Boston & Maine has announced the extension of plans for the modernization and unification of its freight terminals at Boston to include two new car retarder-equipped classification yards, one inbound and one outbound. Construction on these yards is now under way.

MICHIGAN. — The Grand Trunk Western has awarded a contract to the Jones Contracting Co., Cleveland, for grading in connection with the extension of the yards at Pontiac. The total amount of excavation involved is about 200,000 cu. yd.

MISSISSIPPI. — The St. Louis-San Francisco has awarded a contract to the C. G. Kershaw Contracting Co., Birmingham, for laying rail and ballasting on the new line between Aberdeen and Aliceville, Ala., 57 miles, to cost approximately $200,000.

MONTANA. — The Northern Pacific has awarded a contract to Foley Brothers, St. Paul, for grading and track

laying on an extension from Glendive to Brockway, 62 miles, to cost about $1,000,000.

NEW JERSEY.—The Erie has awarded a contract to Frank Brown, Inc., Jersey City., for lowering streets along the main line at Jersey City and for paving work in reduction of the street approaches. This work, which is in connection with increased trackage to be laid in the near future, will cost about $90,000.

NEW YORK.—A complete rehabilitation of the classification and terminal facilities of the Boston & Maine at Mechanicsville is under way, involving an expenditure of about $380,000. A car retarder system is being installed to speed up classification and switching work, to hasten the movement of cars into New England, and to do the work more efficiently and more economically.

OREGON.—The Oregon - Washington R.R. & Navigation Co., has awarded a contract to Clifton, Applegate & Toole, Spokane, for grading and widening cuts and embankments at points between Huntington and Pendleton, to extend passing tracks; to cost about $150,000.

—Ground has been broken for the 70 mile extension on the Oregon, California & Eastern, a Southern Pacific subsidiary, from Sprague River Landing east to Lakeview to connect with the Nevada, California & Oregon, also controlled by the Southern Pacific. A contract for the first section of the road, presumed to be seven miles, has been awarded to John Morgan of Klamath Falls.

—The public service commission of Oregon has asked the I. C. C. to have some one of the Oregon railroads, or some group, construct a new east and west line through the center of the state from Harriman to Crescent Lake, on the assertion that Oregon business interests require the service such a line could render.

PENNSYLVANIA.—The I. C. C. has permitted the Pennsylvania to intervene as a party to the proceedings on the application of the Pittsburgh & West Virginia for authority to build an extension from Cochran's Mill to Connellsville.

—The Central of New Jersey has awarded a contract for necessary grading to widen its roadbed west of its Bethlehem engine terminal, and to relocate the public highway adjacent thereto, to F. H. Clement & Co. Estimated cost, $55,350.

—The Pennsylvania has started the physical work of electrifying its Octoraro branch, extending from Philadelphia through Landsdowne, Morton, Media and Swarthmore to Wawa and West Chester. The concrete foundations for poles to support overhead wires on the Octoraro branch are now being laid. The work will proceed out the branch to West Chester, 27 miles. Steady progress is being made on the electrification work between Philadelphia and Wilmington. All the new larger and higher signal bridges made necessary by the pantographs on top of the electric cars have been installed.

TEXAS.—The I. C. C. has authorized the San Benito & Rio Grande Valley to construct an extension from a point near La Paloma in a general southeasterly direction for about 7 miles, but has denied the application as to a further extension of 8 miles to Brownsville, which the company desired to postpone for three years.

—The Kansas City, Mexico & Orient Ry. will soon apply to the I. C. C. for permission to extend its lines from Alpine, to Presidio on the Rio Grande, where connection will be had with an Orient branch leading to Topolobampo on the west coast of Mexico. If the permission is granted and the plan carried through ,original plans of the road's builders, calling for a line to link Wichita, Kan., northern teminus, with the west coast of Mexico, will be brought to realization.

VERMONT.—The new classification yard at White River Junction at which the Boston & Maine will exchange traffic to and from both of its Canadian connections is now well advanced and partly in operation.

WASHINGTON.—The Great Northern has been authorized to construct a new line between Berne and Scenic, 10 miles, via the new Cascade tunnel, and to abandon the old line between the same points, about 17 miles.

—Expansion of the freight yards of the St. Paul at Earlington near Renton, north of Seattle, is planned by the receivers of the road as soon as authority is received from the federal court. They plan to spend $2,300,000 in improvements involving the laying of new tracks and acquiring new freight yards and connections. Funds for the Earlington work will be from this appropriation.

WISCONSIN.—The Milwaukee Electric Railway & Light Co. will spend nearly $800,000 this year in reconstructing tracks and paving in Milwaukee and suburbs.

Buildings and Structures

ARKANSAS.—Curtis. The Missouri Pacific has awarded a contract to the List Construction Co., Kansas City., for grading, draining and constructing bridges and culverts on the second main track between Curtis and Bierne, ten miles, to cost about $863,000.

ARIZONA.—Bright Angel Point. The Union Pacific is said to be planning a tourist lodge, with necessary facilities in connection with it, on the northern rim of the Grand Canyon. The present plans call for 70 sleeping lodges in addition to the main lodge, a hydro-electric power plant, a water supply station and sewage disposal system. The estimated cost is about $550,000.

—El Tovar. The Santa Fe Harvey system is preparing to erect a $500,000 hotel on the Southern rim of the Grand Canyon, where the noted Hotel El Tovar has proved inadequate.

—Winslow. The Harvey system hotel is to have an addition to care for the heavy tourist travel to the Hopi and Navajo reservations.

CALIFORNIA. — Bakersfield. The Southern Pacific has awarded a contract to the Union Paving Co., Bakersfield, for paving team tracks and driveways at the freight station.

—San Rafael. The Northwestern Pacific, it is reported, is planning to remodel the present station.

CANADA.—Alyth, Alta. The Canadian Pacific has awarded a contract to J. H. Simmons, Winnipeg, for a six-stall brick addition to the enginehouse.

—Nelson, B. C. The Canadian Pacific will construct a five-stall brick and steel addition to the enginehouse, with stalls 85 feet long.

—North Bend, B. C. The Canadian Pacific is said to have prepared plans for a two-story concrete and brick office building, to cost about $36,000. The building will contain 14 bed-rooms, with two bath rooms, and a dining room and will be used as a yard and dispatching office.

COLORADO.—Brush. The Burlington, it is said, has prepared plans for a one-story brick combined passenger and freight station.

—Greeley. The Union Pacific will construct a brick and terra cotta passenger station.

DELAWARE.—Canal. The Pennsylvania has awarded a contract to the Armstrong, Latta Co., Philadelphia, for a fender for the bridge over the Delaware and Chesapeake Canal.

FLORIDA. — Lakeland. The Atlantic Coast Line has awarded a contract to Roberts & Schaefer Co., Chicago, for a 500-ton simplex automatic electric coaling station.

ILLINOIS.—Chicago. The Chicago & North Western received bids until June 27 for the remodeling of a boiler house at the Chicago Terminal avenue terminal, to cost $12,000.

—Springfield. The Chicago, Springfield & St. Louis, it is said, will construct a six-stall enginehouse, using company forces.

INDIANA.—Gibson. The New York Central has awarded a contract to Joseph E. Nelson & Sons, for a brick and concrete interlocking tower, to cost about $12,000.

—Michigan City. Contracts have been awarded for a new passenger station to be used jointly by the Chicago, South Shore & South Bend R. R. and the Shore Line Motor Coach Co., a subsidiary. The cost of the station, with an adjoining garage for 40 motor coaches, will be more than $200,000. It will be a two-story structure with offices for operating officials of the motor coach company on the second floor. Additional ground near the station has been purchased to provide loading facilities for the motor coaches.

IOWA.—Iowa City. The Rock Island is said to be planning the remodeling of its freight station.

KANSAS. — Emporia. The Santa Fe has awarded a contract to C. A. Fellows, Los Angeles, for a 50-stall concrete and brick enginehouse, a one-story apprentice school, a two-story brick locker building, a brick ice house and a power house in connection with the enlargement of the engine terminal. Contracts will be awarded at some future date for cinder and sand handling facilities and a coaling station. Grading, track laying and bridging in connection with the terminal will be done by the road's own forces.

—Parsons. The Missouri - Kansas-Texas, is said to be planning a one-story reinforced concrete pumping house and oil storage tanks, to cost about $45,000.

MAINE.—Houlton. The Bangor & Aroostook, it is said, will build a 400-ton steel bridge.

MARYLAND. — Amcelle. The Baltimore & Ohio has awarded a contract to the Vang Construction Co., for a subway under the tracks, to cost about $19,000.

—Cumberland. The Baltimore & Ohio has awarded a contract to the Vang Construction Co., Cumberland, for a subway to cost about $25,000.

MASSACHUSETTS. — South Boston. The New Haven has awarded a contract to Henry R. Kent & Co., Rutherford, N. J., for a central boiler plant, to cost about $500,000.

MISSISSIPPI. — Mendenhall. The Gulf & Ship Island has awarded a contract to the Zitterell-Mills Co., Webster City, Iowa, for cinder and sand handling facilities.

MISSOURI.—Bonne Terre. The Mississippi River & Bonne Terre has awarded a contract to Fairbanks Morse & Co., for a 200-ton reinforced concrete automatic conveyor type coaling station.

—Hermann. The Missouri Pacific will receive bids for a water treating plant until July 6. The estimated cost is $30,000.

—Kansas City. The St. Louis - San Francisco has awarded a contract to Roberts & Schaefer Co., Chicago, for a 400-ton, 4-track reinforced concrete simplex automatic electric coaling station.

—St. Louis. The citizens bonds issue supervisory committee has approved plans for a reinforced concrete viaduct over the line of the St. Louis-San Francisco at Ellendale avenue, to cost about $531,000. The Frisco will contribute $300 000.

—Springfield. The St. Louis - San Francisco will divide with the city of Springfield, the cost of a highway subway at National avenue, to cost about $90,000 and a viaduct at Benton avenue, to cost $75,000.

NEBRASKA.—Linwood. The Chicago & North Western is said to be planning a two-stall enginehouse.

NEW JERSEY. — Jersey City. The Pennsylvania has awarded a contract to Stevens-Alquist, Inc., Hackensack, for a signal tower and breaker house.

—Newark Bay. The Lehigh Valley and the Pennsylvania will open bids, about July 1, for construction work in connection with a joint double-track bridge.

—Weehawken. The New York Central has received bids for alterations to the ferry terminal but has temporarily delayed awarding the contract. The alteration will consist principally in renewing the ferry bridges and installing modern mechanical operation.

NEW YORK.—East Creek. The New York Central, it is said, will build a 250-ton bridge.

—Harmon. The New York Central has awarded a contract to the Walsh Construction Co., Davenport, for a 31-stall enginehouse, to cost $470,000.

—Hastings. The New York Central has awarded a contract to Louis Chevalier, Inc., New York, for a substation.

—New York City. The New York Central has awarded a contract to the Lyons-Slattery Co., Inc, New York, for a substructure and superstructure of a bridge at Dyckman street.

—Ozone Park. The Long Island has been ordered by the New York state transit commission to eliminate five grade crossings. Estimated cost, $2,-136,600.

—Phillips Manor. The New York Central has received bids for a sub-station, to cost about $100,000.

—Port Morris. The New York Central has asked for bids for a water intake for the power house.

—Yonkers. The New York Central closed the bids for a foundation for a turbine generating station on June 28.

OHIO.—Cincinnati. In line with extensive improvements which will greatly facilitate the handling of business through the passenger and freight terminals at Cincinnati, the Chesapeake & Ohio has announced the contemplated expenditure of $12,000,000 for separation of grades at Covington, Ky., and for rebuilding the bridge over the Ohio River between Covington and Cincinnati. A new bridge to span the Ohio will be built immediately down stream from the present structure. It will consist of two 450-ft. shore spans and one 675-ft. channel span. The present bridge will be converted into a highway bridge, the tracks being removed and concrete slabs placed between the trusses, which will provide a threeway driveway. The railroad viaduct approaches on each side of the bridge also will be removed and replaced with highway approaches with entrance at Fourth and Main streets in Covington, and Smith and Third streets in Cincinnati, as at present. Between Licking River bridge and Covington yard five bridges over streets will be renewed with modern structures having concrete and ballast floors carrying the tracks. Two viaducts in this section about 400 feet long will be filled. At Madison avenue, Covington, the present grade crossing will be eliminated, and an underpass provided. The tracks between Fifteenth street, Covington, and the south bank of the Ohio River will be raised on fill, so that the grade will be .3 per cent as compared with 1 per cent as at present. Four tracks will be added between Twelfth street and Eighth street, making six tracks between these points and two tracks will be added from Eighth street to Sixth street, making four tracks between these points. From Twelfth street to Sixth street inclusive, the present grade crossings will be eliminated, and overhead bridges or subways provided, except that Ninth street will be closed. From Fifth street, to the south bank of the Ohio River a modern double track viaduct with concrete and ballast floor carrying the track will be built. The tracks at the passenger station, Pike street, Covington, will be elevated about 16 feet, and three covered platforms, each about 900 feet long, will be provided, one on each side of the four tracks and one in the center, so that all tracks will be served by platforms. The platforms will be reached by subway and steps from the passenger station, and baggage elevators will be provided in each platform to handle baggage from the station level to the track level. On the Ohio side of the river the present viaduct approach from the south bank of the Ohio River to Mill street will be replaced with modern structure and from Mill street to the

Big Four tracks the present single track viaduct will be replaced by a double track steel viaduct.

The single track Inter-Terminal R.R. from Second and Smith streets to Fifth and Baymiller streets, where it connects with the Baltimore & Ohio tracks, and which is supported on a steel viaduct, will be double tracked.

—Cleveland. The Pennsylvania has awarded a contract to the Dresser Company, Cleveland, for draining and paving driveways at the Woodland ave. freight house.

—Napoleon. The Detroit, Toledo & Ironton has awarded a contract to the Handysite Construction Co., Detroit for culverts and grade separation structures near Napoleon and Malinta, to cost about $500,000.

—Wooster. The Pennsylvania has awarded a contract to the T. F. Foley Construction Co., Pittsburgh, for a bridge, to cost about $75,000.

OREGON.—Albina. The Union Pacific is said to be planning a car repair shed, to cost about $50,000.

PENNSYLVANIA.—Bethlehem. The Central of New Jersey has decided to increase the proposed 6-stall enginehouse to 16 stalls and will ask for new bids. This company has awarded a contract to Roberts & Schaefer Co., Chicago, for a 600-ton, 4-track reinforced concrete automatic coaling and sanding plant.

—Black's Run. The Bessemer & Lake Erie will replace the present timber bridge with a steel bridge, with a concrete floor. The work will be done by the road's own forces, and will cost about $30,000.

—New Galilee. The Pennsylvania has awarded a contract to the T. F. Foley Construction Co., Pittsburgh, for a bridge, to cost about $75,000.

—Rouseville. The Pennsylvania has awarded a contract to the Milliron Construction Co., DuBois, Pa., for an overhead bridge and viaduct, to cost about $50,000.

—West Morrisville. The Pennsylvania has awarded a contract to the T. F. Foley Construction Co. for an enginehouse extension, to cost about $75,000.

TENNESSEE.—Yale. The St. Louis-San Francisco has awarded a contract to the C. G. Kershaw Contracting Co., Birmingham, Ala., for a 24-stall frame enginehouse.

TEXAS.—Amarillo. The Rock Island has awarded a contract to Joseph E. Nelson & Sons, Chicago, for a six-stall brick addition to the enginehouse, to cost about $40,000.

—Houston. The Missouri-Kansas-Texas received bids for a freight warehouse and station until June 27.

VIRGINIA.—Danville. The Southern has awarded a contract to J. P. Pettyjohn & Co., Lynchburg, for an office building.

WASHINGTON. — Bellingham. The Great Northern has awarded a contract to George H. Moon, Bellingham, for a passenger station, to cost about $60,000.

Locomotive Orders

After the large orders placed during May for locomotives the market took a decided slump. No orders of consequence were placed during June. Our reports show orders for only 27 steam and one electric engine, the largest orders reported being those of the Lehigh & New England and the Kansas, Oklahoma & Gulf. The Peoria & Pekin Union also ordered the 3 8-wheel switchers, which we stated they intended buying in our June issue. All of these three orders were awarded to the Baldwin Locomotive Works. Other orders were small, and largely for export. No large inquiries have developed up to this time. The Missouri Pacific is said to be inquiring for 5 Mikados, and the Denver & Rio Grande for a few Mallets and Brown-Bevis Co., Los Angeles wants a 50 to 60-ton second-hand saddle tank engine.

On June 15 Class 1 railroads had 9557 locomotives in need of repair or 15.6 per cent of the number on line. This was an increase of 527 compared with June 1, at which time there were 9030 or 14.7 per cent; 5253 were in need of classified repairs and 4,304 were in need of running repairs. Serviceable locomotives in storage totaled 6,142 compared with 6320 on June 1.

Department of commerce reports show that a total of 481 locomotives have been shipped by the builders from January 1 to June 1. The shipments are divided up as follows: January, 57; February, 80; March, 137; April, 98; May 109.

From January 1 to the date of our going to press orders have been received by the locomotive builders for a total of 440 engines. In addition to these the Pennsylvania is building a number of engines in its own shops. A complete list of orders for this year follows:

Purchaser	No.	Type	Builder
Alab. State Docks	1	Switching (6)	Amer.
Amtorg Trading Corp.	3	Saddle-tank	Amer.
Apalachicola Nor.	1	4-6-0	Amer.
A. T. & S. F.	10	Santa Fe	Bald.
Bang. & Aroostook	5	Pacific	Amer.
Barber Asphalt	1	Switching (6)	Bald.
Bertha-Consumers	1	Baldwin-Westinghouse	West.
Can. Nat'l for Grnd	12	4-8-4	Amer.
Trunk	10	Switching	Lima
Central of N. J.	5	Pacific	Bald.
	10	Switching (8)	Bald.
Central Vermont	4	4-8-2	Amer.
Chicago & Ill. Midl.	2	Amer.	Bald.
Chicago, N. S. & M.	2	Electric Gen.	Elect.
C. & N. W.	12	2-8-4	Amer.
	8	Switching (8)	Amer.
	1	60 Ton Diesel Elec. Switching	Amer.
Chicago, S.S. & S.B.	2	Electric	West.
C. B & Q.	12	2-10-4	Bald.
Comm. Edison	1	Switching (6)	Lima
D. & R. G. W.	10	Mallet	Amer.
Del., Lack. & W.	10	**Mountain: 3 cyl.**	**Amer.**
	5	4-8-4	Amer.
Dul., Miss. & Nor.	4	Switching (10)	Bald.
Erie	30	Switching (8)	Bald.
	25	2-8-4	Amer.
	25	2-8-4	Lima
Ferrocar'l de Antioquia Colombia	1	Mikado	Bald.
Gulf Coast	5	Switching (8)	Amer.
	6	Pacific	Amer.
Gulf, Mobile & Nor.	4	Decapod	Bald.
Huntington & B. T.	2	Consolid'n	Bald.
Illinois Central	15	Switching (8)	Bald.
Inland Steel	1	Switching (6)	Bald.
Intern'l Lumber	1	Switching (8)	Bald.
Internat'l & G. N.	5	Switching (8)	Amer.
Johnstown-Stony Ck.	1	Switching (6)	Bald.
Kan.-Okla & Gulf	5	2-10-2	Bald.
Lehigh & Hudson	2	Consolid'n	Bald.
Lehigh & N. Eng.	3	Switching (8) lt.	Bald.
	3	Switching (8) hvy	Bald.
	2	Decapod	Bald.
Manila R. R.	3	Pacific: 3-cyl	Bald.
Mich. L. & Chem.	2	Switching (6)	Lima
Minn. Dakota & W.	1	Switching (8)	Bald.
Missouri Pac.	5	Mountain	Amer.
	15	Switching (8)	Amer.
Mobile & Ohio	5	Switching (6)	Amer.
Monongahela	6	Mikado	Bald.
Mukden & Hailung	4	Mogul	Bald.
New Eng. F. & T. Co.	1	Switching (8)	Amer.
New Orleans G. N.	3	Mountain	Amer.
New York Cent'l	1	Switching	Amer.
	60	Hudson	Amer.
N.Y., N. H., & H.	6	3 cyl. switching (8)	Amer.
Oliver Iron M. Co.	10	Switching (8)	Lima
Peoria & Pekin Un.	3	Switching (8)	Bald.
Peruvian Govt.	2	Mikado	Bald.
Pickands-Mather	2	Switching (6)	Lima
Hiram Ricker & Son	1	Switching (6)	Amer.
Sorocabana Ry.	10	4-8-2; 3 cyl.	Amer.
Southern Pac.	10	4-10-2; 3 cyl.	Amer.
Texas & Pac.	15	2-10-4	Lima
Toledo, Peoria & W.	4	Mikado	Amer.
Usina Jungueira Peru	1	Consolidation	Amer.
Youngstwn & Nort'n	2	Switching (6)	Amer.

Passenger Car Orders

During June the roads ordered 65 regular passenger service cars, 16 self propelled cars, 10 trailers, and 20 street cars. The largest order was that of the Norfolk & Western for 25 all-steel mail cars awarded to Bethlehem Steel. Other orders were: Reading, 10 baggage cars to American Car & Fdry., and 5 to Bethlehem Steel; Illinois Central, 10 baggage to St. Louis Car; Burlington, 5 lounge to Pullman; Illinois Central, 6 combination baggage and mail cars to American Car & Fdry. The 20 new street cars were ordered by the Houston Electric Co. from the St. Louis Car Co. The self-propelled cars were ordered by the Seaboard Air Line, the Santa Fe, the Union Pacific, the Long Island, the Lehigh & New England, and the Toronto, Hamilton & Buffalo.

Our records now indicate that 1278 cars have been ordered this year. The largest inquiries out as we go to press are the Erie for 25 combination baggage and express cars and the Chicago, North-Shore & Milwaukee for 25 steel interurban cars.

Freight Car Orders

The orders for freight cars placed by the Illinois Central at least saved the records for the first six months of 1927. These orders, with others placed during June, brought the total for the first six months just barely above orders for the first six months of 1926 when 41,431

cars were ordered. The Illinois Central order was divided up among the builders as follows: Standard Steel Car, 700 hopper; Mt. Vernon Car, 500 box; Bettendorf Co., 500 flat; Pressed Steel, 500 automobile; General-American, 500 automobile; Pullman, 500 box and 300 hopper; Illinois Car & Mfg., 500 gondola and American Car & Fdry., 500 gondola. Other orders placed during the month include the following: Lehigh & New England, 200 all-steel box cars to Pressed Steel; Duluth, Missabe & Northern, 250 ore cars divided between Standard Steel and General American; Chicago & Illinois Midland, 350 coal to Pullman; Litchfield & Madison, 100 drop-bottom, and 147 solid bottom, gondolas to American Car & Fdry.; New York Central, 10 special flat cars to Standard Steel Car; Georgia & Florida, 60 box cars to American Car & Fdry.; New Jersey, Indiana & Illinois, 100 box to American Car & Fdry Co.

The Western Wheeled Scraper Co. received the following orders for air-dump cars: Western Pacific, 40; Union Pacific, 6; Denver & Salt Lake, 6; Pacific Great Eastern, 10; Ft. Worth & Denver City, 2.

Reports made to the car service division of the A. R. A. show that freight cars in need of repair on June 15 totaled 144,885 or 6.4 per cent of the number on line. This was a decrease of 2,564 from the number reported on June 1, and a decrease of 23,842 compared with the same date last year. Figures of the car service division also show that on June 15 the Class 1 railroads had 277,115 surplus freight cars in good repair and available for service. Surplus coal cars totaled 86,310, box cars 145,183, stock cars 22,948 and refrigerator cars 15,122.

Bus and Truck Orders

The statement from the department of commerce, based on reports received from 121 manufacturers in the United States, shows that in May, 44,173 trucks and buses were produced (factory sales). This compares with 44,071 for May, 1926, and brings the total for the first five months of this year up to 209,254 a gain over the same period last year of 14,597. The figures for May in Canada show a gain of 212 over May, 1926, the production in that country totaling 3717 for the month.

The Standard Oil Co. of New Jersey has ordered 64 two-and-one-half ton trucks and 8 heavy duty trucks from the White Co. This company also recently received an order for 26 trucks from the Union Oil Co. of California, and one for 17 from the Shell Co. of California. Recent orders for buses include the following: Northern Electric Ry., two from Amer. Car & Fdry. Motors; Chicago Surface Lines, 5 twin coaches from Frank R. Fageol; Pittsburgh Motor Coach Co., 6, from Yellow; Market Street Ry., 1 from Fageol; United Electric Railway, 4, from International; Connecticut Co., 3, from International; Washington Ry. & Electric Co., 3 from Yellow; Illinois Power & Light Corpn., 7, from Yellow; City Railway of Los Angeles, 6 from Yellow; Milwaukee Electric Ry. & Light Co., 3, from Yellow; Wisconsin Public Service Co., 4 from Yellow.

Changes in Personnel

Executive & Operating

R. P. Gillham, vice president of the Campbell's Creek, has been elected president. **C. R. Gillham** has been elected vice president.

C. E. Spens, vice president in charge of traffic of the Burlington, and **E. P. Bracken,** vice president in charge of operation, have been elected vice presidents of the Colorado & Southern.

H. W. Johnson has been appointed comptroller of the Colorado & Southern with headquarters at Chicago. **W. M. Holden** has been appointed assistant secretary.

John W. Seens has been elected president of the Essex Terminal at Walkerville, Ont.

M. F. Rolfe has been appointed assistant to the vice president and general manager of the Maine Central.

L. S. Benjamin has been elected vice president and general manager of the Rio Grande, Micolithic & Northern, at Houston.

W. G. Jones, superintendent of the North Carolina division of the Seaboard Air Line, at Hamlet, has been appointed assistant to the vice president in charge of operations, at Savannah. **W. P. McLain** has been detailed for special work at the request of the president, with the title of agent, executive department, with headquarters at Miami.

Harry G. Taylor has resigned as chairman of the Nebraska state railway commission to become director of public relations of the car service division of the A. R. A., with headquarters in Washington. In addition to his other duties Mr. Taylor has served for several years as chairman of the Central Western Shippers' Regional Board. **John E. Curtiss,** Lincoln, has been named a member of the Nebraska railway commission to succeed H. G. Taylor. Mr. Curtiss will serve until a successor is elected in November, 1928. He formerly served for seven years as secretary of the commission.

James P. Neal, city attorney of Walla Walla, Wash., has been appointed to the post of supervisor of transportation in the department of public works of Washington at Olympia. Mr. Neal replaces O. O. Calderhead, resigned.

W. C. Beck, assistant superintendent on the Quebec district of the Canadian Pacific at Ottawa has been transferred to the Grownsville division of the New Brunswick district, with headquarters at Brownville Junction, Maine.

J. M. Raine has been appointed assistant superintendent, Sewell Valley sub-division, of the Chesapeake & Ohio, with headquarters at Rainelle, W. Va.

A. R. Pelnar, formerly assistant superintendent and transportation inspector on the Chicago & North Western at Chicago, has been appointed assistant to the general manager, with headquarters at the same point. **L. A. Clapp,** superintendent of the Iowa division of the Chicago and North Western, with headquarters at Boone, Iowa, has been transferred to the Galena division, with headquarters at Chicago, succeeding **F. F. McCauley,** deceased. Other appointments are as follows: **E. L. Henry,** superintendent of the Iowa division; **H. R. Cooke,** assistant superintendent, with headquarters at Clinton, Iowa; **R. J. Hall,** trainmaster at Council Bluffs; **C. H. Humphreys,** trainmaster at Boone.

A. H. Ehlers has been appointed superintendent of the Copper Range, with headquarters at Houghton, Mich.

E. J. Thomas, agent for the Detroit & Toledo Shore Line at Toledo, has been appointed trainmaster, with headquarters at the same point, succeeding **V. A. Cooper,** retired under the pension rules of the company.

C. W. Brown, superintendent of the Lehigh & New England, with headquarters at Bethlehem, has been appointed general superintendent, with headquarters at Philadelphia. The office of superintendent has been abolished.

F. M. Christen has been appointed acting superintendent of dining and sleeping cars of the Soo Lines, with headquarters at Minneapolis, succeeding **Charles F. Sundell,** who has been

granted a leave of absence on account of ill health.

R. K. Rochester, general superintendent of the New Jersey division of the Pennsylvania, has been appointed assistant general manager of the eastern region, with headquarters at New York. **R. C. Morse,** general superintendent of northern division, succeeds Mr. Rochester as general superintendent of the New Jersey division. Other appointments are as follows: **F. D. Davis,** general superintendent of the northern division, with headquarters at Buffalo; **W. C. Higginbottom,** general superintendent of transportation, western region, with headquarters at Chicago; **J. B. Phelan,** superintendent of the Philadelphia division, with headquarters at Harrisburg; **P. W. Sullivan,** superintendent of the eastern division, with headquarters at Pittsburgh; **J. A. Appleton,** superintendent of the Columbus division, with headquarters at Columbus, O.; **Raymond Swenk,** superintendent of the Erie and Ashtabula division, with headquarters at Newcastle, Pa.; **N. S. Menaugh,** superintendent of freight transportation, eastern region.

S. Howard Reid has been appointed superintendent of the electric railway division of the Porto Rico Railway, Light & Power Co., San Juan. Mr. Reid formerly was superintendent of construction of export cars at the Philadelphia plant of the J. G. Brill Co.

C. F. Franklin, passenger train supervisor on the Rock Island at Kansas City, has been appointed passenger trainmaster on the Chicago terminal division at Chicago, succeeding **C. G. Adams,** transferred to Goodland, Kan. **H. W. Hammack,** chief dispatcher at El Reno, has been appointed trainmaster at the same point.

C. H. Sauls, superintendent of the Virginia division of the Seaboard Air Line, with headquarters at Raleigh, has been transferred in the same capacity to the North Carolina division, with headquarters at Hamlet, succeeding **W. G. Jones,** promoted. **L. T. Foster,** superintendent of the East Carolina division at Charleston, succeeds Mr. Sauls as superintendent of the Virginia division. Other appointments are as follows: **T. A. Norris,** superintendent of the East Carolina division; **C. E. Matthews,** general supervisor of passenger operations, with headquarters at Savannah; **W. R. Olive,** trainmaster of the North Carolina division at Hamlet; **W. B. Carson,** passenger trainmaster of the North Carolina division at Hamlet; **W. A. Smith,** assistant trainmaster of the North Carolina division.

T. R. Baird, formerly supervisor of transportation on the northern district of the Southern Pacific, has been appointed assistant supervisor of transportation with headquarters at San Francisco, succeeding **L. D. Jones,** who has taken a position with the Southern Pacific Motor Transport Co. **L. H. Cecil,** assistant to the vice president and general manager of the Texas and Louisiana Lines at Houston, has been appointed assistant to the executive vice president, with headquarters at the same point. **T. H. Meeks,** assistant superintendent of the Beaumont division, with headquarters at Houston, succeeds Mr. Cecil, and **Tom Scott,** assistant superintendent of the Jacksonville district of the Beaumont division, has been promoted to senior assistant superintendent of that division, succeeding Mr. Meeks.

Carl Beach has been appointed superintendent of the Union Pacific with headquarters at Pendleton, Ore.

E. D. Hanes has been appointed acting superintendent, New River division, of the Virginian Railway with headquarters at Princeton, W. Va., succeeding **J. W. White,** who has been granted leave of absence on account of illness.

Financial and Legal

Bertram Quelch, assistant auditor of passenger receipts of the Atlantic Coast Line, at Wilmington, has been appointed auditor of passenger receipts, succeeding **George S. Legrand,** deceased. **W. S. Ledbetter** has been appointed auditor of construction.

S. L. Porter, auditor of freight accounts of the Burlington, has been promoted to auditor on the staff of the comptroller at Chicago. **H. C. Holzbach,** chief clerk to the auditor of freight accounts succeeds Mr. Porter. **R. C. Smith,** chief clerk to the general auditor and comptroller, has been promoted to assistant auditor of freight accounts, with headquarters at Chicago.

T. H. Best, assistant to the treasurer of the central region of the Canadian National, at Toronto, has been appointed treasurer of the Canadian National Telegraphs, at Toronto.

W. W. Smithey, auditor of the railroad commission of Texas at Austin, has been appointed auditor of the Rio Grande, Micolithic & Northern at Houston.

Ira A. Place, vice president, legal department of the New York Central Lines at New York, has been appointed senior legal vice president of the New York Central, the Michigan Central, the Cleveland; Cincinnati, Chicago & St. Louis, and the Pittsburgh & Lake Erie with the same headquarters. **Charles C. Paulding,** assistant vice president legal department, has been appointed vice president, public relations, and **Robert J. Cary,** general counsel, has been appointed vice president and general counsel of the same railroads.

R. F. Scott, Jr., has been appointed treasurer of the Paris & Mt. Pleasant, at Paris, Texas.

Purchases and Stores

George Hutchins has been appointed assistant general storekeeper of the Burlington at Denver.

Traffic

F. A. Layman has been appointed district freight agent of the Baltimore & Ohio with headquarters at Pittsburgh.

F. M. Keane has been appointed assistant coal freight agent, with headquarters at Pittsburgh. **L. W. Land** has been appointed division freight agent at St. Louis in charge of St. Louis, East St. Louis, Ill., district and St. Louis division west of Flora, Ill., including off-line territory in Illinois on and west of the Illinois Terminal R. R., Alton to Formosa, also south and west of the B. & O., Caseyville, through Flora to Shawneetown.

George Stephen, assistant freight traffic manager of the Canadian Pacific at Winnipeg, has been appointed freight traffic manager with headquarters at Montreal, succeeding **E. N. Todd,** resigned.

George F. Knight, division freight agent on the Chicago & Eastern Illinois at Danville, Ill., has been appointed general agent of the Wisconsin territory, with headquarters at Milwaukee, succeeding **R. L. Gainer,** transferred to Detroit. **J. D. Sneed** has been appointed division freight agent at Danville. **C. R. Jones** has been appointed general agent in the New Orleans territory, with headquarters at New Orleans.

A. M. Culver has been appointed general agent at Los Angeles for the Chicago & Illinois Midland and the Chicago, South Shore & South Bend.

J. A. Simmons, general traffic manager of the Cincinnati, Indianapolis & Western, which has now become a part of the Baltimore & Ohio, with headquarters at Indianapolis, has been appointed freight traffic manager of the Baltimore & Ohio, with the same headquarters. Other C. I. & W. appointments are as follows: **R. B. Kinkaid,** assistant general freight agent of the B. & O. at Cincinnati; **D. C. O'Dell,** division freight agent of the B. & O. with headquarters at Springfield, Ill.; **P. M. Havens,** division freight agent of the B. & O., with headquarters at Indianapolis. **W. M. Smothers** has been appointed district freight agent of the B. & O. with headquarters at Decatur, Ill.

J. E. Buckingham, general freight and passenger agent of the Colorado &

Southern, has been promoted to traffic manager, succeeding **H. A. Johnson**, retired. **G. H. Logan** has been appointed general freight agent, and **F. I. Anderson** has been appointed general agent at Denver.

J. E. Propper has been appointed general freight agent of the Erie Railroad, with headquarters at New York, succeeding **R. D. Tilt** who has resigned to become a member of the auxiliary committee of the Trunk Line Association. **O. M. Meyne** has been appointed assistant general freight agent and **E. N. Hambly** has been appointed chief of traffic bureau at New York.

J. V. Lanigan, general passenger agent of the Illinois Central with headquarters at Chicago, has been appointed passenger traffic manager, with headquarters at the same point. Other appointments are as follows: **G. G. Truesdale**, general passenger agent, succeeding **Mr. Lanigan; A. C. Linton**, general passenger agent, with headquarters at New Orleans, succeeding **W. H. Brill**, deceased; **S. B. Mitchell**, assistant general passenger agent, with headquarters at New Orleans.

T. J. Fretz, general freight and passenger agent of the Lehigh & New England, with headquarters at Bethlehem, has been appointed traffic manager, with headquarters in the same city. **F. W. D. Goddard** succeeds Mr. Fretz as general freight and passenger agent at Bethlehem.

Gilbert W. Miller and **Lucien Snow** have been appointed assistant to the reight traffic manager of the Maine Central.

W. J. Landon, assistant general freight agent of the New Haven, with headquarters at New Haven, has in addition been appointed commerce assistant. **R. A. Flynn** has been appointed assistant to the freight traffic manager, with headquarters at New Haven.

H. M. Fletcher, formerly manager of the organization tours department of Raymond & Whitcomb, with headquarters at Boston, has been appointed assistant general passenger agent for the Northern Pacific with headquarters at New York.

H. A. Triebel, chief of the traffic bureau of the Rock Island at Chicago, has been appointed assistant general freight agent with headquarters at the same point.

C. C. Dana has been appointed freight traffic manager of the Santa Fe, with headquarters at Chicago, succeeding **Fred B. Houghton**, promoted.

The following changes and appointments in the freight traffic department of the Seaboard Air Line are effective July 1: **C. E. Muller**, assistant freight traffic manager, temporarily transferred to Norfolk; **E. J. Parrish**, appointed assistant freight traffic manager, Jacksonville, with jurisdiction over all freight traffic matters in Jacksonville territory and solicitation, service, and kindred matters (excepting industrial development, leases, etc.) in Florida; **R. W. Daniel**, assistant general freight agent, transferred to Savannah; **J. W. Booth**, assistant general freight agent, Tampa, will assume charge of reassigned Tampa territory; **F. G. Roberts**, appointed assistant general freight agent, Miami, in charge of Miami territory; **E. P. Mills**, appointed division freight agent, at Jacksonville.

G. C. Robson has been appointed district passenger agent of the Southern Railway, with headquarters at Dallas, and **C. D. Whitworth** has been appointed district passenger agent at New Orleans. **Wins F. Wilson**, assistant general freight agent, lines east, at Richmond, has been appointed general freight agent, lines east, succeeding **J. H. Drake**, deceased. **J. H. McCabe** succeeds Mr. Wilson as assistant general freight agent.

Recent appointments in the passenger department of the Southern Pacific are as follows: **F. S. Howard** and **N. Kinell**, assistant passenger traffic managers with system jurisdiction; **Garnet King**, assistant passenger traffic manager in charge of the central passenger district; **E. E. Wade**, assistant to passenger traffic manager; **K. C. Ingram**, general advertising agent; **W. J. Quinn**, chief clerk to the assistant passenger traffic manager of the central passenger district. Headquarters of these newly-appointed officers will be at San Francisco. **A. S. Rosenbaum**, district freight and passenger agent at Medford, Ore., has been appointed general agent, with headquarters at the same point. **C. J. McDonald**, superintendent of perishable freight service for the last seven years, has been appointed manager of perishable freight traffic, with headquarters in San Francisco.

V. H. Richardson has been appointed assistant general passenger agent of the Southern Pacific of Mexico, with headquarters at Guadelajara, Jal. The headquarters of the traffic department has been moved from Guaymas, Son., to Guadelajara.

M. J. Costello, western traffic manager, **C. W. Meldrum**, assistant general passenger agent, and **A. J. Grummett** and **B. S. Merritt**, assistant general freight agents of the Great Northern, at Seattle, have been also appointed in corresponding capacities for the Spokane, Coeur D'Alene & Palouse.

Fred B. Houghton, freight traffic manager of the Santa Fe with headquarters at Chicago, has been appointed vice president in charge of traffic, succeeding **Edward Chambers**, deceased. Mr. Houghton entered railway employ in 1883 as clerk and operator on the Toledo, Peoria & Western since which he has been with the Santa Fe, first as a telegraph operator and then in the accounting and traffic departments. From 1891 to 1897 he was clerk and chief clerk to the freight traffic manager at Chicago; from 1897 to 1901 he was division freight and passenger agent at El Paso; from 1901 to 1905 he was assistant general freight agent at San Francisco, at which time he was made assistant freight traffic manager. He was made freight traffic manager in 1909.

Bode K. Smith, assistant freight traffic manager of the Western Pacific, has been promoted to passenger traffic manager, with headquarters at San Francisco. He is succeeded by **R. D. Williams** formerly traffic manager of the Sacramento Northern, a subsidiary of the Western Pacific. **John C. Stone**, formerly in the president's office of the Sacramento Northern has been appointed assistant general freight and passenger agent with headquarters at Sacramento. **L. I. McKim**, formerly assistant general passenger agent of the Sacramento Northern has been appointed district passenger agent with headquarters at Sacramento.

A. M. Baker has been appointed district freight agent of the Seaboard Air Line at Miami. Other appointments are: **J. W. Roberts** and **Wallace Smith**, commercial agents, Miami; **T. B. Grady**, commercial agent, West Palm Beach; **D. W. Anderson**, commercial agent, Chattanooga; **E. H. Finney**, commercial agent, Macon.

H. H. Baker, superintendent of the dining car service of the Pennsylvania lines east of Pittsburgh, at New York, has been appointed special agent and assigned to the staff of the general passenger agent at New York. **C. E. Milliron**, superintendent of the dining car service, lines west of Pittsburgh, at Columbus, has been appointed superintendent of dining car service, lines east of Pittsburgh. **J. F. Finnegan**, special representative in the passenger traffic department at Chicago, succeeds Mr. Milliron at Columbus.

Mechanical

C. F. Morrett, assistant trainmaster of the second district of the Marion division of the Erie, at Huntington, Ind., has been appointed supervisor of locomotive operation on that division. **G. E. Lund**, master mechanic, at Huntington, has been appointed assistant superintendent of the car department at the same point.

J. R. Vance, mechanical inspector of

the Gulf Coast lines with headquarters at Houston, has been appointed chief mechanical inspector of the Gulf Coast lines and the International Great Northern, with headquarters at the same point.

J. L. Bracken, engineering assistant on the New Haven, at New Haven, has been appointed assistant to the mechanical superintendent of the New York division with headquarters at New York.

Robert P. Blake, master mechanic of the Montana division of the Northern Pacific, has been transferred to the St. Paul division, with headquarters at St. Paul, during the absence of **J. B. Neish**, who has been granted an extended leave of absence. **Edmund H. Carlson** has been appointed acting master mechanic of the Montana division, with headquarters at Livingstone, and **Ralph E. Hammond** has been appointed assistant master mechanic, Fargo division, with headquarters at Staples, Minn., during the absence of Mr. Carlson, temporarily transferred.

H. W. Yates has been appointed master mechanic of the Rio Grande, Micolithic & Northern, with headquarters at Van Horn, Texas.

G. S. Goodwin, mechanical engineer of the Rock Island at Chicago, has been appointed assistant to the general superintendent of motive power at the same point.

Christopher C. Anders has been appointed acting road foreman of engineers, St. Paul division, of the Northern Pacific, with headquarters at St. Paul.

Civil

C. R. Adsit, assistant division engineer of the Chicago division of the Baltimore & Ohio, with headquarters at Garrett, Ind., has been appointed acting division engineer of the Indianapolis division, with headquarters at Indianapolis, succeeding **H. F. Passel**, transferred to valuation work. **J. G. Begley**, assistant on the engineering corps of the Akron division, succeeds Mr. Adsit as assistant division engineer of the Chicago division.

G. H. Stead, general superintendent of the western lines of the Canadian National Telegraphs, with headquarters at Winnipeg, has been appointed superintendent, with jurisdiction over lines in British Columbia, with headquarters at Vancouver. **R. W. Ball**, general superintendent of the eastern lines, with headquraters at Toronto, succeeds Mr. Stead as general superintendent of the western lines, and **J. F. McTaggart**, treasurer, with headquarters at Toronto, succeeds Mr. Ball.

V. H. Carruthers, roadmaster on the Kettle Valley, at Penticton, B. C., has been appointed roadmaster on the Canadian Pacific at Weyburn, Sask., succeeding **Patrick O'Connell**, deceased. **Frank Ades**, acting roadmaster on the Saskatoon division, with headquarters at Lanigan, Sask., has been appointed roadmaster on the same division with headquarters at Strasbourg, Sask., to succeed **A. J. Swanson**, retired. **J. Stewart**, roadmaster at Lanigan, who has been on leave of absence, has resumed his duties.

Elmer McFadden, assistant roadmaster of the Colorado & Southern at Trinidad, has been transferred to the same position at Cheyenne.

Robert H. Corson has been appointed superintendent of telegraph of the Erie, with headquarters at Paterson, N. J., succeeding **Edward P. Griffith**, deceased.

M. O. Woodrow has been appointed assistant supervisor on division 5 of the Long Island, succeeding **C. J. Henry**, who has been transferred to division 1 to take the place of **F. H. Bensch** who is on leave of absence.

T. A. Youngblood, assistant division engineer of the International-Great Northern at Houston, has been appointed assistant engineer of the Houston Belt & Terminal, at Houston, succeeding **H. E. Stuckert**, appointed division engineer of the Houston North Shore all subsidiaries of the Missouri Pacific.

H. F. Schryver, valuation engineer of the Ohio Central lines of the New York Central, at Columbus, has been transferred to the chief engineer's office as principal assistant engineer, with the same headquarters. **V. L. Nelson** has been appointed acting valuation engineer. Other appointments are as follows: **C. V. Bucher**, division engineer at Charleston, W. Va.; **G. H. Smith**, division engineer at Columbus; **J. Boler**, supervisor of bridges and buildings at Hobson, O.; **R. C. Billet**, supervisor at Fostoria, O.; **C. A. Geiger**, supervisor at Toledo; **J. E. Temple**, supervisor at Corning, O. **C. M. McVay**, division engineer at Charleston has been temporarily assigned to special construction work.

William S. McCarthy, has been promoted to roadmaster, Dakota division, of the Northern Pacific, with headquarters at Carrington, N. D.

E. H. Kersting, assistant division engineer, Chicago terminal division of the Pennsylvania, has been appointed assistant engineer, office of chief engineer, maintenance of way. Other appointments are as follows: **J. H. Cooper**, engineer maintenance of way, southern division, with headquarters at Wilmington; **F. M. Hawthorne**, division engineer of the Philadelphia terminal division; **H. T. Frushour**, division engineer of the Cleveland & Pittsburgh division with headquarters at Cleveland; **Thomas Holt**, supervisor, telegraph and signals, Chicago terminal division; **C. J. Lantz**, supervisor, telegraph and signals, Columbus division; **C. P. Woodson**, supervisor, telegraph and signals, Grand Rapids division; **C. W. Suesse**, supervisor, telegraph and signals, Cincinnati division.

E. G. Ericson, assistant to the chief engineer of the Pennsylvania, attached to the central region, at Pittsburgh, has retired under the pension rules of the company, having completed nearly 44 years of continuous service with the railroad.

Frank Manning has been appointed assistant division engineer of the Pere Marquette, with headquarters at Grand Rapids. **H. D. Tubbs** has been appointed resident engineer in charge of yard construction and grade revision at McGrew, Mich.

C. M. Setzer has been appointed assistant bridge and building supervisor, Charlotte division of the Southern Railway, with headquarters at Gainesville, succeeding **B. O. Wooley**, deceased.

J. P. Mack has been appointed division engineer on the Los Angeles & Salt Lake unit of the Union Pacific System, with headquarters at Los Angeles.

William Mahan, superintendent of bridges and buildings on the Wheeling & Lake Erie, at Brewster, Ohio, has been assigned to special work in connection with depreciation and valuation, with the same headquarters. **W. L. Peoples**, district roadmaster on the Toledo division, succeeds Mr. Mahan as superintendent of bridges and buildings. **W. F. Shepherd**, has been appointed district roadmaster on the Toledo division.

Obituary

Richard C. Campbell, general freight agent of the Reading, at Philadelphia died at his home on June 7 after a protracted illness.

Charles H. Ackert, who retired as vice president of the Chicago & Alton in 1910, died at his home at Lake Forest, Ill., June 5.

Henry R. Judah, pioneer railroad man of the West, and former assistant general passenger agent of the Southern Pacific System between Portland and El Paso, died at his home in Los Altos, June 16.

Ernest Stenger, former general superintendent of the Union Pacific and since 1920, president of the Denver Tramway Co., and president of the Denver & Intermountain, died at Denver, after a short illness, May 28.

Edwin Hale Abbot, retired railroad executive, died at his home in Cam-

bridge, Mass., on May 30, after a prolonged illness, aged 93.

C. G. Juneau, master car builder of C. M. & St. P., died at his home in Milwaukee, of heart disease, May 26.

William Rannie, of the firm of Ironsides, Rannie & Campbell, one of the pioneer railway contracting concerns in Western Canada, died in Vancouver, B. C. June 26.

Charles D. Barrows, purchasing agent of the Maine Central, at Portland, Maine, died May 12 after an illness of several weeks.

Robert Craig, assistant engineer on the Missouri Pacific with headquarters at St. Louis, died June 2 at the Missouri Pacific hospital in that city.

Judge James H. Reed, president of the Bessemer & Lake Erie, died at his home in Pittsburgh, June 17, aged 73.

Henry Torpin, pioneer railroad builder, died at his home in Van Nuys, Cal., June 20.

J. L. A. Baldwin, district superintendent of the Pullman Co., with headquarters at Boston, died June 12 in Albany, N. Y. of heart disease.

Edwin S. Jackman, of E. S. Jackman & Co., Chicago, died May 30 at Santa Barbara.

Guy Eastman Tripp, chairman of the board of directors of the Westinghouse Electric & Manufacturing Co., died June 14, in the New York hospital, New York. Mr. Tripp was born in Wells, Maine, April 22, 1865, and was educated at South Berwick Academy. He became associated with Stone & Webster, construction engineers and operators of public utilities, in 1897, occupying successively important positions until he was elected vice president of the Stone & Webster Engineering Corpn., and the Stone & Webster Management Association. During the reorganization of the Metropolitan Street Railway Co. of New York, which has passed into receivership, Mr. Tripp was selected as chairman of the joint committee on reorganization. After he completed his work as chairman of the joint committee he was elected chairman of the board of directors of the Westinghouse Electric & Manufacturing Co., in which capacity he continued until his death. During the World War he was made assistant to the chief of ordnance of the United States army, with the rank of brigadier general.

Alexander B. Brown, of the Canadian Westinghouse Co., Ltd., died on June 8.

P. William Kromer, Buffalo district manager of the Air Reduction Sales Co., New York, died at the Buffalo General Hospital May 21, following an illness of five weeks.

Charles A. Vermillion, assistant to the president of the Spokane, Portland & Seattle, at Portland, Ore., died at St. Vincent's hospital in that city of heart disease, June 14.

Robert Irving, who was president of the Kaslo & Slocan (merged with the Kootenay Railway & Navigation Co., and now a part of the Great Northern) from 1899 to 1905, died at his home in Vancouver, B. C., June 10.

Edward H. Blossom, at one time assistant superintendent of the St. Johnsbury & Lake Champlain (now a part of the Boston & Maine) and general manager of the Hardwick & Woodbury, died at Macon, Ga., June 19, aged 75.

Lee R. Jones, general agent for the Missouri Pacific at Mexico City died at his home in that city, June 18.

Frank A. Middleton, general agent of the Union Pacific, died at his home in Riverside, Calif., July 1, after less than a day's illness.

Supply Trade Notes

The **Robert Bosch Magneto Co.** has moved its office from 123 West Sixty-fourth street, New York, to 3601 Queens boulevard, Long Island City.

The **Graybar Electric Co.** has taken over the country-wide distribution of the poles of the **International Creosoting & Construction Co.,** of Galveston, and with a few territorial exceptions will handle creosoted southern pine through all its 61 distributing houses.

The **Clark Trucktractor Co.,** Buchanan, Mich., has moved its general offices from Buchanan to the factory at Battle Creek.

The **Frank Adam Electric Co.,** St. Louis, has made arrangements for representation in eastern territory with the **Square D Co.,** Walkerville, Ont., which will handle Frank Adam products from its sales offices at Toronto and Montreal and will assemble these products in its plant at Walkerville.

The **Lincoln Electric Co.,** Cleveland, has appointed the **Wade Engineering Co., Los Angeles,** its distributor for California. The **Big Three Welding & Equipment Co.,** Fort Worth, distributor of Lincoln products, for Texas and Oklahoma has opened a warehouse branch at Tulsa.

The **North American Car Corpn.,** has opened a district office at Dallas, in charge of **R. W. Patterson,** formerly a representative in the export department at New Orleans.

The **Industrial Works,** Bay City, has closed its district office at 823 South Oregon avenue, Tampa. The district office at Atlanta will in future handle all the business of Florida, Alabama, Georgia, North Carolina, South Carolina and the eastern part of Tennessee.

Charles McNichol, division traffic manager of the **American Bridge Co.,** has been appointed traffic manager with headquarters at Pittsburgh.

The **Whiting Corpn.,** Harvey, Ill., has appointed **J. F. Shouse & Co.,** 1197 Starks building, Louisville, as sales representative for the state of Kentucky and the southern part of Indiana.

The **Chipman Chemical Engineering Co.,** Bound Brook, N. J., has opened a Canadian office in the Trust and Loan Building, Winnipeg, in charge of **J. D. Ruttan.** This company has also established a factory at Winnipeg to enable it to serve the Canadian railways better and particularly to aid in the execution of a contract for the treatment of approximately 2,700 miles of the western lines of the Canadian Pacific with Atlas weed killer.

The **Graybar Electric Co.,** New York, has opened a new distributing house at 1529-31 First avenue, North Birmingham, Ala.

A. O. Woerner, representative of the **Scullin Steel Co.,** St. Louis, has been appointed assistant vice president.

The **Hyman-Michaels Co.,** Chicago, has appointed the **Hofius Steel & Equipment Co.,** Seattle, its representative in Washington and the Northwestern territory.

James R. Fitzpatrick has been appointed vice president of the **Haskelite Manufacturing Corpn.**

The **Falk Corpn., Milwaukee,** has opened an office at 122 South Michigan avenue, Chicago, in charge of **C. H. Thomas.**

T. F. Carlin has been appointed eastern sales manager of the **Louisville Frog & Switch Co.,** Louisville, with headquarters at Washington, D. C.

E. W. Thomas, Jr., has been appointed representative of the **Reading Iron Co.,** Reading Pa., in the Chicago territory.

Gordon L. Edwards, assistant treasurer of the **United States Steel Corpn.,**

has been elected treasurer, succeeding **F. M. Waterman**, deceased. **J. H. Gewecke**, assistant treasurer, has been appointed first assistant treasurer.

Roy Dixon has been appointed railway representative of the **Charles R. McCormack Lumber Co.**, San Francisco, succeeding **Mason Kline** who has resigned to enter other business.

J. A. Morris, for many years identified with the sale of Mack trucks for the International Motor Co., has joined the **Autocar Company's** factory organization as assistant sales manager.

The **Graham-White Sander Corpn.** has appointed the **T-Z Railway Equipment Co.**, 14 East Jackson boulevard, Chicago, as Chicago representative, and the **International Railway Supply Co.**, 30 Church street, New York, as expert representative for the sale of Graham-White Sanders to all territory outside of the United States and Canada.

Eric H. Ewertz, general manager of the Moore plant of the **Bethlehem Steel Co.**, has resigned to open an office as an independent consulting engineer at 50 Church street, New York.

George Thomas, 3rd., has been appointed treasurer of the **Lukens Steel Co.**, Coatesville, Pa.

Earle M. Harshbarger, formerly with S. F. Bowser & Co., Fort Wayne, is now associated with the **S. K. F. Industries, Inc.**, New York, and will handle railroad and engineering sales in the territory east of Pittsburgh. **M. S. McNay**, formerly sales manager of the **Bock Bearing Co.**, Toledo, has been appointed western sales representative, with headquarters at 1140 W. Washington boulevard, Chicago.

John B. Reynolds, former general secretary of the Indianapolis chamber of commerce, has been appointed director of the industrial depelopment department of the Middle West Utilities Company, Chicago.

A. L. Broomall has been appointed manager of the renewal parts engineering department at both the Homewood and the East Pittsburgh works of the **Westinghouse Electric & Manufacturing Co.** **C. L. Fortescue** has been appointed consulting transmission engineer. He will concentrate his attention principally upon more fundamental problems of electrical transmission lines in general and will have a consulting relationship with engineering in other departments. **G. M. Barrow** has been appointed manager of engineering at the Westinghouse Derry works. **N. A. Wahlberg**, formerly attached to the East Pittsburgh office, has been placed in charge of engineering on transmission line fittings at Derry.

Windsor T. White, chairman of the board of the **White Company**, is making a two months' tour of Europe to attend various automotive meetings. He is one of four American delegates from the National Automobile Chamber of Commerce to the meeting of the International Chamber of Commerce in Stockholm, June 27 to July 2. He will also attend meetings of the Royal Automobile Club and the Swedish Dealers' Association in Stockholm.

Carl Abell, advertising manager of the **American Car & Foundry Co.**, has been transferred to the Pacific Coast sales force. He will be succeeded by **James J. McMahon**, formerly of the sales promotion department of the International Motor Co.

The **Foos Gas Engine Co.**, Springfield, O., has changed its name to the **Foos Engine Co.** A factory branch will be established at Tulsa, and the branch staff will include sales representatives and service engineers. **Garvey & Palmer, Inc.**, the company's Pacific Coast representatives, have established offices in Los Angeles, San Francisco and Seattle.

Bernard Allen, assistant engineer of the bureau of economics of the Canadian National at Montreal, has resigned to become affiliated with the **Scarr Transportation Service**, railway and highway consulting engineers, New York.

The **National Bearing Metals Corpn.**, has been incorporated under the laws of New York state. In the new corporation will be merged the **Bronze Metal Co.**, New York; **More-Jones Brass & Metal Co.**, St. Louis; **Keystone Bronze Co.**, Pittsburgh; **Brady Brass Co.**, Jersey City; **Southern Brass Works, Inc.**, Portsmouth; and **Damascus Bronze Co.**, Pittsburgh. The offices of the company will be at 4930 Manchester Avenue, St. Louis, and 30 Church street, New York. The following officers have been elected: **Alexander Turner**, chairman of the board; **John B. Strauch**, president; **Thomas H. Wright**, vice president; **Arthur N. Dugan**, vice president; **S. W. Crawford**, vice president; **W. K. Frank**, vice president; **A. Y. Evins**, vice president; **R. S. Herman**, vice president; **Frank H. Senn**, secretary and assistant treasurer; and **J. S. Neuworth**, treasurer and assistant secretary.

The **Wodack Electric Tool Corpn.**, Chicago, has moved to its new building at 4627-29 West Huron street.

Otis B. Duncan has been appointed Chicago representative of the **K. & W. Equipment Co.**, for its rail layer. Mr. Duncan has also been appointed representative for the **Keystone Grinder and Manufacturing Co.**, Pittsburgh.

The **Reliance Manufacturing Co.**, has purchased a two-acre site in Alhambra, Calif., and will move its plant from Pasadena to that city upon completion of the buildings which are to be erected at a cost of $150,000. The **Reliance Foundry Co.**, operated in conjunction with the manufacturing company will also be located in Alhambra.

S. H. Blake has been appointed chairman of general and other standardizing committees of the **General Electric Co.**, succeeding **A. H. Moore**, who will retire August 1, after 39 years service with the General Electric Co., and its associated foreign manufacturing companies.

The Kent, Ohio, plant of the **American Car & Foundry Motors Co.** has been acquired by **Frank Fageol**, who has incorporated the **Twin Coach Company** to manufacture the "twin" motor coaches designed by him. The Twin Coach Co. has been incorporated in Delaware with $4,000,000 par value preferred stock and 400,000 shares of no par value common stock.

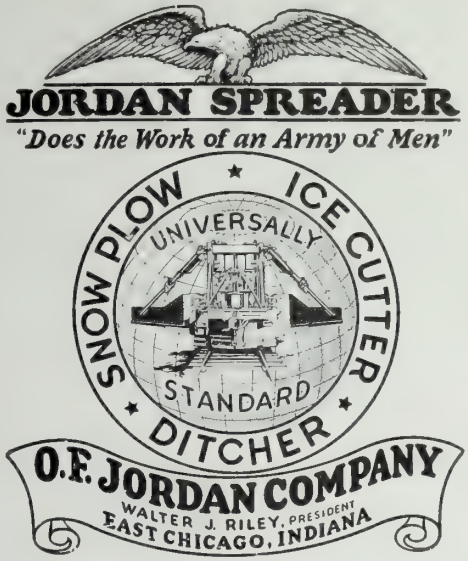
The **C. O. Bartlett & Snow Co.**, Cleveland, has opened a district office at 406 Bessemer building, Pittsburgh, in charge of **W. C. Shade.**

W. L. Mellon, president of the Gulf Oil Corpn., has been elected to fill a place on the board of the **Westinghouse Electric & Manufacturing Co.**, made vacant by the resignation of **R. B. Mellon**, president of the Mellon National Bank.

Laurence R. Wilder, president of the **American Brown Boveri Electric Corpn.**, has resigned to become chairman of the advisory committee of the shipbuilding division of the corporation.

The Chicago Pneumatic Tool Co., New York, announces the removal of its St. Louis office, service department and warehouse on July 1, from 813 Hempstead street to 1931 Washington avenue.

SHANNAHAN BROS., INC.
RAILROAD CONSTRUCTION SINCE 1904
Track Material—Equipment—Grading—Excavating
Track Layouts for Industrial Plants
Phone: MUtual 7507
742 San Fernando Bldg. - Los Angeles



The JORDAN is an all-the-year-'round machine. It spreads materials, digs ditches, moves earth, rips out ice, fights snow.

Jordanized Ditchers aid proper drainage.

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

For detailed description see Car Builders Cyclopedia

CLARK CAR COMPANY
BALANCED DOOR DUMP CAR
PITTSBURGH, PA.

San Francisco Rialto Building	Minneapolis Baker Bldg.	Richmond, Va. Am. Nat. Bk. Bldg.
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Center Plates
Draw Bar Yokes
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Air Brake Pins
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Journal Box Wedges
and
Miscellaneous Forgings

Send us your specifications

Steel Car Forge Company

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'RALSTON BUILT'

Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
COLUMBUS, OHIO

Transportation

Under The Jacket—

of The New "Hudson Type" Locomotive

GRAHAM-WHITE SANDERS have been applied to insure against loss of tractive effort.

IT IS SAFE to apply Graham-White Sanders under the jacket because they are self-cleaning and are proof against dogging and sand blasting. They sand correctly "rain or shine."

THE FIRST COST of Graham-White Sanders is quickly returned in the savings effected in sand, labor and sander repairs.

"Perfectly Simple, Simply Perfect"

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H. L. Burrhus
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Canadian Representative
Railway & Power Engineering Corp., Ltd.
133 Eastern Avenue, Toronto, Canada

Export Representative
International Railway Supply Co.,
30 Church Street, New York

GRAHAM-WHITE SANDERS

CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industries

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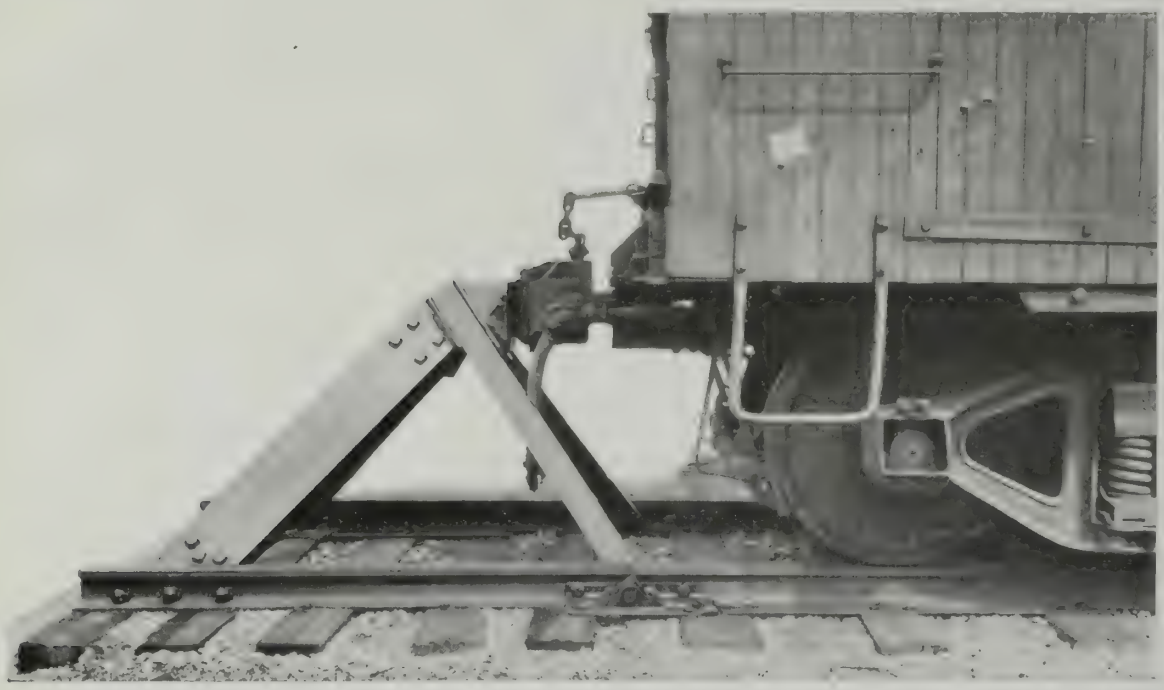
VOL. I AUGUST, 1927 No. 4

Coupler versus wheel contact



Means for stopping cars at the end of a side track may be divided into the two general classes of coupler contact and wheel contact.

The simplest form of wheel contact is the dirt pile; but this is ineffective and unsightly. To maintain it in condition for use is a constant expense.

Others consist of timbers fastened across the track or of metal stops attached to the rails. Various forms of skid shoes or skates have been employed. But the basic difficulty with all these means of stopping cars is that to operate satisfactorily the speed of the cars must in every case be well controlled. If faster than a very low speed the result is a sheared center pin; the body of the car goes over the truck with consequent damage to equipment and lading.

Another common fault of these devices is that when one car has been stopped by them, other cars striking the first one may cause the same damage as if the speed had been too great when the first car reached the end of the track. Any kind of means which acts as a dead stop against moving wheels is wrong in theory and in practice.

A man who has watched railroad progress since the diamond stack wood-burners has seen the automatic coupler for freight cars replace the link and pin in the 80's. Then came the air brake in the 90's. And in this century the friction draft gear has been developed and is a necessary companion of the other inventions.

The vast amount of study and experiment put on the subject of draft gears has made possible the handling of the modern long trains of heavy cars. The shock in starting and stopping is well controlled. A coupler contact post makes use of all of this scientific shock absorbing mechanism. A wheel contact device uses none of it.

The Hayes Type W Bumping Post is a coupler contact post firmly attached to eight cross ties and through them to the ballast. A track joint may break but the post absorbs the shock in a gradual movement of the eight ties and the ballast. The cars are stopped undamaged.

Type W efficiently meets modern needs in stopping cars.

There are on an average 19 pins in the Foundation Brake Gear—between the cylinder and the brake beam. A little wear in each pin hole will accelerate the wear of the pins, introduce *impact* on application of brakes and multiply false piston travel.

Schaefer Brake details are so accurately made that they eliminate excessive pin hole wear. Their light weight feature also is of material help in this respect.

Schaefer Truck Lever Connections, Body and Truck Levers, Brake Beam Hangers and Tension Jaws are the products of *engineering skill* and *planning*.

They are built to last the life of the car.

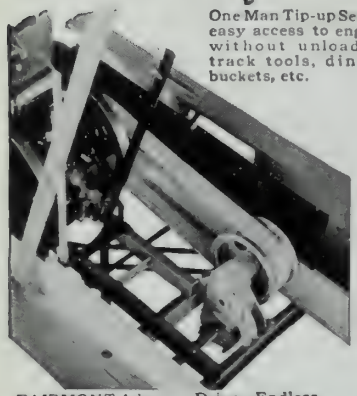
STRENGTH EFFICIENCY HOMOGENEITY

Schaefer Equipment Co.

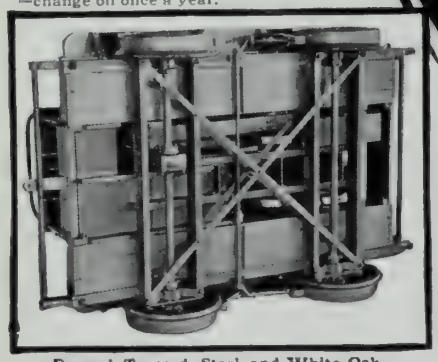
General Offices: Oliver Bldg., Pittsburgh, Pa.

One Man Tip-up Seat—easy access to engine without unloading track tools, dinner buckets, etc.

Why HALF the Railway Motor Cars are Fairmont



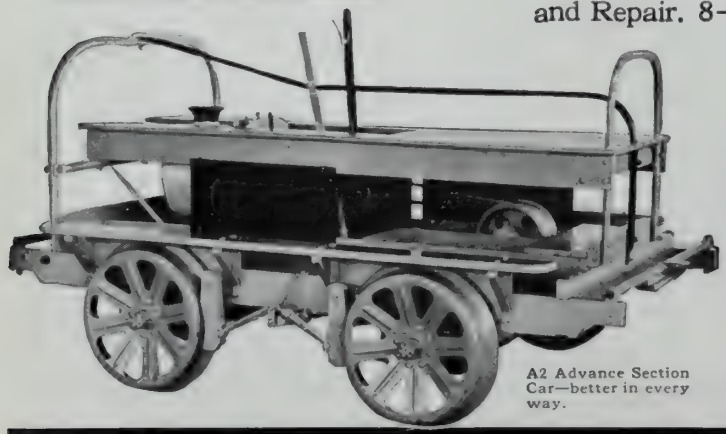
FAIRMONT Advance Drive—Endless Cord Belt—light tension—reduction by ball and roller bearing hardened steel gears in oil-tight dirt-proof case—change oil once a year.



Rugged Trussed Steel and White Oak Frame—no rivets—all parts replaceable.

In the words of an executive with 25 years' mechanical experience, ten of these years in charge of purchase and maintenance of all gas engines and cars on a Class A railroad—Fairmont Motor Cars are so popular with railroad men because of:

"1—Favorable Initial Cost. 2—Long Life. 3—Low Maintenance. 4—Easy Starting and Operation. 5—Simple. 6—Minimum Moving Parts. 7—Ease of Adjustment and Repair. 8—Water Cooling insures long continuous runs or stationary service. 9—Endless Cord Belt Transmission—low initial cost—freedom from failures—smooth and easy to handle. 10—Low Repair Stock Investment."



A2 Advance Section Car—better in every way.

FAIRMONT RAILWAY MOTORS, Inc.
FAIRMONT, MINNESOTA

DISTRICT SALES OFFICES:

New York Chicago St. Louis New Orleans
San Francisco Washington, D. C.
Winnipeg, Can.

BALDWIN LOCOMOTIVE WORKS
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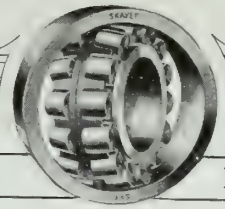
SKF Journal Bearings are basically better than plain bearings



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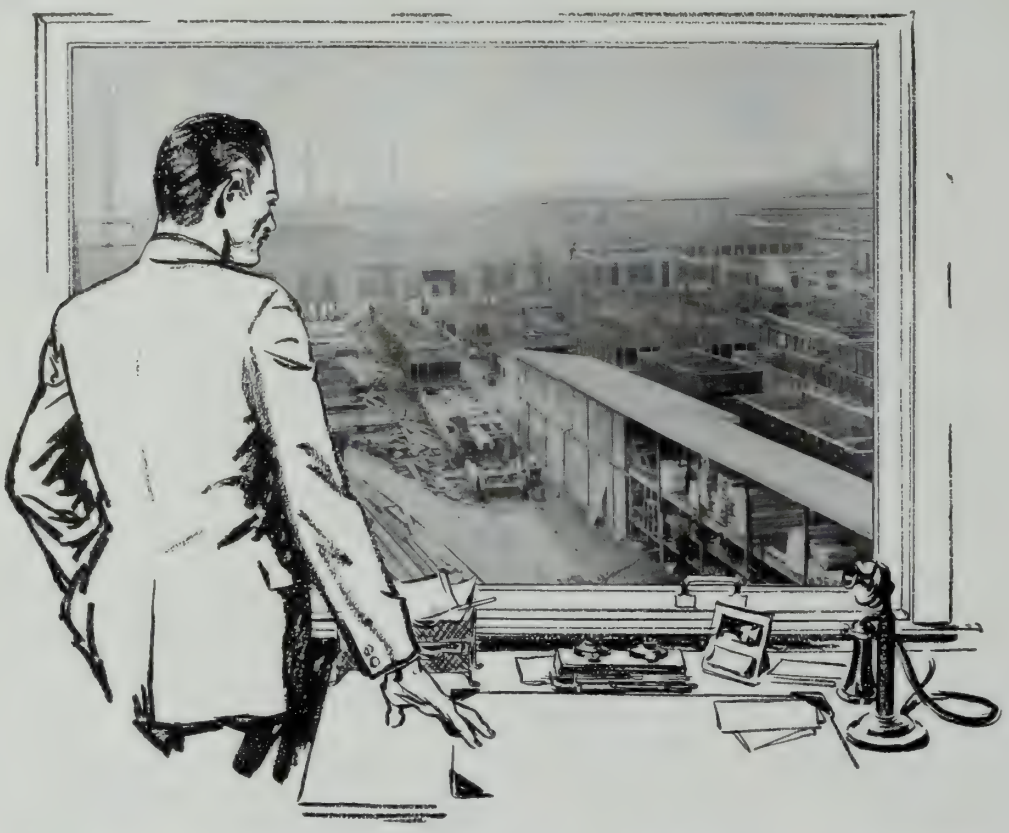

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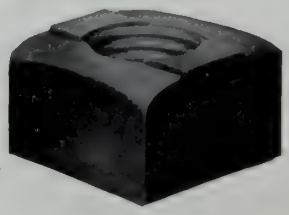

Lock Securely and Permanently—Anywhere on the Bolt

Transportation

The Monthly Magazine of the Transportation Industries

AUGUST, 1927

VOLUME ONE NUMBER FOUR

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Depend upon that Name

Australia A Field for Supply Men

By

Arthur L. Stead

Near Botanical Gardens, Hobart, Tasmania.

AUSTRALIA has an area greater than that of the United States. Its population is only six millions, which is an average of two to the square mile. The huge area of the continent and its remarkably small population make Australia's railroad problems unique; and if there is one corner of the globe where railroad development may be expected to proceed apace in the years which lie ahead undoubtedly it is in this far-flung island of the southern hemisphere.

To understand the railroad situation in Australia, one must never forget that the country as we know it today has not been evolved as a single colony with a central government, but as a collection of six distinct self-governing sovereign states. With few exceptions all of Australia's railroad systems are owned and managed by the respective states through which they run, New South Wales, Victoria, South Australia, Queensland, Western Australia and Tasmania. New South Wales was the first state to begin railroad development, the pioneer road being the Sydney and Parramatta system, 14 miles in length, opened to traffic in 1855.

Following the lead set by New South Wales, in the same year the state of Victoria embarked upon railroad construction, while South Australia also was early encouraged to bring the Iron Road to the aid of its people. By degrees the great mountain ranges of the coastal territory were crossed, and by 1881 the mileage of the Australian roads had grown to 4,192. Between 1881 and 1891 the trackage increased to 10,123 miles, and today there are some 27,000 miles of railroad track opened to traffic.

In the conduct of interstate transportation, immense difficulty has been experienced in Australia by reason of the fact that every state shortsightedly adopted a different gauge for its railroad tracks when embarking upon construction works. New South Wales is the only state whose railroads are built to the standard gauge of 4 feet 8½ inches. Queensland has a gauge of only 3 feet 6 inches, while Victoria has adopted the broad gauge of 5 feet 3 inches. Australian railroads, therefore, do not form a homogeneous system like those of the United States, and through running, as a consequence, is a matter of extreme perplexity.

In recent times immense attention has been devoted by Australia's leaders to the vital question of gauge unification. Conference has succeeded conference. Recently it has been decided to adopt the 4 feet 8½ inch gauge as standard throughout the commonwealth. The estimated cost of converting is put at £57,000,000, and for the moment the scheme is held up owing to lack of funds. One step, however, already has been taken toward unification. This is the putting in hand of the work of construction of a standard gauge

The Supply Trade's Chance

THE rapid growth of steam and electric transportation in Australia, and the fact that eventually the present jumble of track gauges will be changed to a standard, creates what the writer of this article believes to be the big opportunity for American railway supply manufacturers. No more enlightening article of this kind has been printed in recent years. It is worth the careful attention of every manufacturer interested in railroad business.

Gasoline Rail Motor on Bridgewater Bridge Over the River Derment, Tasmania.

road running from Kyogle, in the north coast district of New South Wales to Brisbane, the capital of Queensland, a distance of 100 miles. This road is being built by the commonwealth government and the governments of the states of New South Wales and Queensland. In addition to this road, and the standard gauge roads in the state of New South Wales, the commonwealth government operates a standard gauge route known as the Transcontinental line, which runs between Kalgoorlie in Western Australia and Port Augusta in South Australia, a distance of 1,052 miles. In all its length this railroad does not cross one permanent stream of water. In crossing the Nullarbor Plain the railroad runs without a curve for some 300 miles, constituting what probably is a world's record.

Although government railroad ownership and operation in Australia has been the subject of much adverse criticism in recent years, it should not be assumed that state ownership has been a failure. It is the considered opinion of those best able to judge that, since the government owned the land principally to be developed and settled, and this settlement depended to a great degree upon efficient transport which could not be provided by outside undertakings with financial success, public interests have been best served by the government owned and operated transportation undertakings. This does not, of course, imply that there is not scope for the increased employment of business methods of administration and operation on the Australian state roads. There is a big field for the increased commercialization of the state undertakings, and this factor having been realized, there is today recorded a marked departure from the hide bound and bureaucratical methods of the past in favor of sane business methods, such as are followed by the great railroads of America and other lands.

In the development of locomotive and car stocks, Australia has progressed in harmony with other great countries. New South Wales at present operates the heaviest locomotives in the country, those having a tractive force of 30,500 lbs., but standard Pacific and Mikado types are being introduced, with a tractive force of 38,000 lb. and 45,200 lb. respectively. On innumerable branch routes where heavy steam trains cannot be worked economically use is made with advantage of gasoline-driven rail motors, seating up to 35 passengers, and running at speeds up to 30 miles an hour.

The track of the Australian railroads is of stout construction and well maintained. In New South Wales where railroading has reached a high standard of efficiency, steel rails are employed weighing from 60 to 100 lb. to the yard. The 80 lb. rail is used chiefly for truck road construction, while in the important Sydney suburban zone the 100 lb. rail is favored. Hardwood ties are 8 feet by 9 inches by 4½ inches, with 18 ties to each 40-ft. rail. The track is of the staggered type, with roadbed of sandstone, slag and cinders. In accordance with American practice, the rails rest direct on the ties, and are secured thereto by means of spikes and bolts. Maintenance sections are each about eight miles long, six men normally constituting a gang. Gasoline motor cars are freely employed to afford increased mobility to section forces.

The majority of Australian passenger cars consist of side corridor cars, supplemented by compartment stock equipped with side doors to facilitate entraining and detraining operations. The bulk of the cars are of wooden construction, with steel underframes. Sleeping cars are freely used in the long distance runs, these accommodating up to about 20 passengers, two to the compartment.

Signaling arrangements in operation in Australia vary from the primitive to the ultra modern. In New South Wales the "crossing order" method of supervision was originally favored. Today this has been replaced on single tracks by the electric tablet and the electric staff system, while on the Sydney suburban tracks there are utilized elaborate automatic installations with power-operated interlocking. The West Signal tower at Sydney ranks as one of the largest in Australia. It has 350 levers, worked on the electro-pneumatic principle.

Famous the whole world over are such important passenger de-

Motor Cars Operate on the Multiple Unit Plan on Sydney Electrified Tracks.

pots as the Central station, Sydney, New South Wales, and the Flinders Street station, Melbourne, Victoria. The Central depot at Sydney has 19 platforms of total length of 12,530 feet. Each platform is 700 feet long and 30 feet wide, reached from a commodious concourse. All platforms are at the same level. Some 118 million passengers are handled every year in the Sydney suburban zone. The electrification of the tracks in that zone has proved most successful.

Flinders Street station, Melbourne, is said to be the busiest railroad station in the world. Nearly 300,000 passengers pass through the station daily, and every 24 hours the station deals with 2,450 electric and 250 steam trains. Between 5 and 6 p.m., approximately 75,000 passengers are handled. To cope with this enormous suburban business, trains leave at three and four minute intervals for each of the various lines served by the 16 platforms within the station. Electrification of the Melbourne suburban zone was begun in 1914, and completed in 1923, at a cost of something like 30 million dollars. Included in the electrification was the construction of the southern hemisphere's biggest power plant. Here there are generated annually 260 million units of electric energy. Alternating current at 20,000 volts is transmitted to the substations, for conversion to direct current at 1,500 volts for train operation.

By far the biggest project at present being undertaken in the Australian railroad world, however, is the construction of the Sydney underground railroad. Existing suburban roads are being converted under this plan to electricity, and extended into and around the state capital. A city loop is being formed from which railroads will lead to eastern and western suburbs at present served by street trolley systems. In all the Sydney reconstruction plan will cost about £16,000,000.

Standard Sleeping Cars Give Fast Night Service Throughout Australia.

Australia—Land of Promise

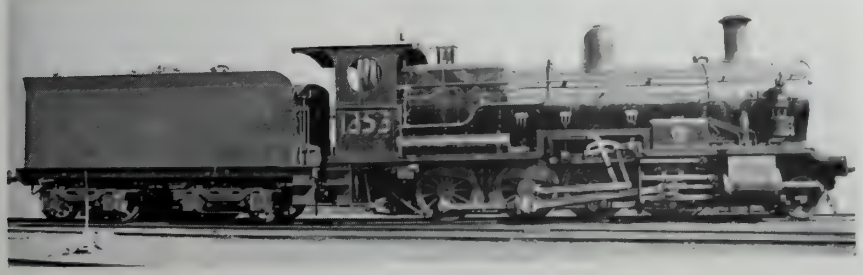
"THE Australian commonwealth now ranks second only to the United States in its per capita production of wealth," writes Sir Hugh Denison, commissioner of the commonwealth government in the United States, in Current History. "The area and resources of Australia make it one of the great countries of the world and one that in the future is bound to become of ever-increasing importance in the Pacific.

*"The total area of Australia is 3,156,134 square miles, but this immense area is sparsely populated with a little more than 6,000,000 inhabitants, 2,750,000 of whom are concentrated in cities. * * * This 5,000,000 is, however, almost wholly of British stock and speaks no language except English; nor is there any colored section of the community to add to such other difficulties as are caused by the presence of foreign elements like those in America. The Australian people are, of course, divided into different political camps, but there is no country in the world where political and economic issues are less complicated by the extraneous questions raised by race, nationality and religion."*

For the movement of freight business Australian railroads employ a vast number of varying types of cars. Open cars predominate on the majority of the state systems. In New South Wales the length of the standard open car is 18 feet, the width 8 feet 11 inches and the height of the car body 2 feet 10½ inches. For grain in bulk there are utilized 40-ton hopper cars, while refrigerator cars of American design are largely employed. These cars are 36½ feet long, and have a carrying capacity of 20 tons. Generally speaking, the flow of traffic is from the interior to the coast cities, and there is much empty haulage as between the coast and the great farm lands of the interior to meet the unbalanced working.

A feature of freight train operation in Australia is the development of the train control system of supervision, on lines similar to those favored in Britain. The system is an expansion of the train dispatching method favored in America, and had its birth in Britain some years ago, following visits paid to the United States by leading railroad officers from England. Outstanding among the larger control offices in Australia is that maintained for the supervision of traffic movement in the Sydney suburban zone.

For the handling of freight business in this important area, freight tracks quite distinct from those used for passenger service are employed. Freight traffic



Heavy Freight Locomotive Used on New South Wales Railroads.

movement in the Sydney district is centered on the Enfield gravitational marshalling yards, nine miles from Sydney central station. These yards are a mile long and half a mile wide. They comprise 94 sidings with a total trackage of 37 miles, accommodating 5,000 cars. Every signal tower, station, switchman's post and junction in the Enfield freight zone is connected by an elaborate system of telephones on the Western Electric selector plan with the control office. The traffic controllers are thus able to see at any moment the precise position in the yards and on the tracks, and to adjust working as may be called for in the interests of efficient and economical operation.

Viewed from every angle, vast progress has in recent times been made by the railroads of Australia. Had it not been for the vexed question of the differing gauges, it seems certain that the country would have ranked long ago among the world's leaders in the operation of fast, through long distance services on its railroads. Owing to the short sighted policy adopted in the past, it is only with extreme difficulty that transcontinental movement can be accomplished. As indicated, however, this obstacle to efficiency is being faced today in earnest. Much engineering ingenuity has been brought into play in connection with the construction of devices to make the interchange of traffic between the narrow, standard and broad gauge routes practicable. The majority of these inventions have been in the line of special axles carrying two pairs of wheels so arranged that the inside pair automatically takes the load when transferring from the broad to the narrower gauges. In the reverse direction the outer wheels operate at the change from narrow to standard or broad gauge. The application of devices of this character to the whole of the locomotives and cars of the country would, however, be an enormously costly affair, and at the best can only be regarded as a temporary palliative for the gauge difficulty.

In the new era which is setting in, and with the probable early embarkation upon a big plan for gauge standardization, there should be presented immense opportunity for the railway supply trade in providing the vast quantities of steel and other equipment called for by the change-over.

American railroad supply undertakings would do well to keep a close watch upon affairs in Australia.

The products of America have always been well favored by the Australian railroads, and it is a significant fact that on all the state roads the use of American Railway Association specifications and symbols is common.

In every branch of working the influence of American ideas is apparent, and in the signaling field good business already has been secured by American makers.

Although, at the moment, financial obstacles are tending to delay the embarkation upon gauge standardization in Australia, it is realized everywhere that the longer unification is postponed the more costly and difficult will the undertaking become, since railroad construction is proceeding all the time, in differing gauges, at the rate of something like 1,000 miles a year.

Not only in Australia, but also in government circles in London, this need for standardization is daily becoming a subject of vital and urgent importance. It appears probable that at an early date the complete scheme for standardization will be sanctioned. Out of the existing mixed gauge railroads of Australia there will thus arise a single, unified transportation system of standard gauge track, offering speedy and uninterrupted movement for passengers and freight throughout the continent from end to end.

Don't Be a Knocker

Don't knock your employers. Don't knock the policy of the company. Don't knock your business associates. Don't knock anything or anybody in the business. Be loyal, get the spirit of boosting and be a regular fellow. If you can't boost the business you are in and be a loyal supporter of it from start to finish, resign.

Croydon, A Typical Station on the Sydney Suburban Railroads.

But "Bamberger's Folly" Made Good

A Prosperous Electric Line

By Charles Dillon

WHEN Simon Bamberger, former governor of Utah, conceived the idea, more than 30 years ago, of building a railroad for local service only between Salt Lake City and Ogden the usual chorus went up from the standpatters. Bamberger's Folly, they called it. It was simply throwing away money. It would not pay. Wasn't the territory served by the Denver & Rio Grande and the Union Pacific? Why build another?

But Governor Bamberger had been noticing a number of things for quite a while, one of them being that the steam roads seemed more concerned about through traffic than about the local, which was perfectly natural, the managements having keen regard for the business which at that time produced the money. Local service was inconveniently arranged as to schedule. It was painfully infrequent. Business men lost a lot of valuable time waiting for trains, and these waits cut into their revenues and held back the progress of the region. The governor thought he saw an opportunity to build up a thriving local business between Ogden, the Gateway City, a hustling railroad center, and Salt Lake City, the state capital and all 'round headquarters for that part of the country.

But there was one farseeing gentleman present who did no ridiculing of the Bamberger project. This was Brigham Young. He was a born optimist, this Mormon pioneer-leader, and he told the governor his road would succeed, and that it would be but a few years until Salt Lake and Ogden would so grow that in riding from one to the other it would be difficult to know where the one began and the other ended.

Julian M. Bamberger, President and General Manager, Bamberger Electric Railroad.

The early history of the railroad was one of many financial problems. Only continued optimism and perseverance, and the investment of Mr. Bamberger's personal resources made it possible to continue to success against much opposition from strong money interests during a period rather discouraging for railroad promotion.

Originally incorporated in the early 90's as the Great Salt Lake & Hot Springs Ry. (for a few years it stopped at the Springs, where a bathing resort and bicycle saucer race track was built) later it was reorganized under the name of the Salt Lake & Ogden Ry. Co. Every few years a few miles of track were added. A summer resort known as Eden Park added revenue for a while. Then, in 1907, the line went on to Farmington where a cat-tail swamp was drained to make a garden spot known as Lagoon, now one of the finest amusement parks in the West, the "Prettiest Spot in Utah," famous for its fresh water bathing, dancing, beautiful flowers and the fastest one-mile horse race dirt track in the United States. After this park had assisted the railroad with its earnings, Mr. Bamberger pushed on toward Ogden where he arrived in 1908.

Although franchises permitted the use of the public roads without cost, yet private right of way was purchased and the line was built with a maximum of 1.1 per cent grade, although a large expenditure was frequently required to avoid heavy grades. Foresight on Mr. Bamberger's part is evidenced by the fact that the original location is still occupied, and no change has ever been warranted while other interurbans in the state, built since, have had to relocate and abandon tracks built on high roads and at heavy grades when new conditions demand speed and economy.

Electricity was adopted in 1910 as an improved motive power, permitting faster and more frequent service at reduced cost, and the steam engines, especially those of the type that had given the road the name "dummy line" were abandoned. However, freight was handled by steam until 1914 when electric locomotives for freight service were purchased. Since that time all operations have been by electricity, although the way structures, bridges, culverts, underpasses, etc., are all of a concrete and permanent nature and capable, if occasion warranted, of carrying the standard heavy steam

equipment used in this territory by the transcontinental steam lines.

In 1917, to accord with the popular nickname, the line became officially known as the Bamberger Electric Railroad. The policy always has been to give just a little better service than the traffic demands. The finest type of interurban passenger cars are operated at high speed covering the 36 miles between Salt Lake City and Ogden, making 12 to 15 stops, in 70 minutes. Service is given hourly on the hour northbound, hourly on the half-hour southbound, and additional half-hour trains are operated during morning and evening rush hours. Equipment is kept in first class condition both as to paint and daily cleaning and careful inspection of mechanical operations. Frequent excursion rates, week-end and Sunday reduced fares, mileage, commutation and student tickets, help to make the service popular.

The Bamberger Electric's motto "Give the public the service it wants" was maintained when it became apparent that much of the passenger traffic had gone to the private automobiles. The company decided to install de luxe bus service between Salt Lake City and Ogden. The buses purchased are of the parlor car type, six cylinders, with a seating capacity of 31 passengers. The new schedule became effective May 15 this year. While the buses have not yet had a fair trial yet it is apparent the people in this section prefer the electric trains although the bus and rail fare is the same. This preference is no doubt due to the high class, frequent service of the electric trains.

During the last few years the interurban railroads throughout the country have been confronted with rapidly increasing costs of operation, while their gross passenger incomes, due to the privately owned automobile, have been decreasing at an alarming rate. Much study has been given by both the engineering and financial interests to assist the interurban railroads in continuing business under the existing unfavorable conditions, due to this situation. One of the most encouraging results due to this study has been the successful installation and operation of what is known as the one man operated car, called, in many places the safety car. Different sections of the United States report various accomplishments realized by this departure from the ordinary methods of interurban operation, but the main reasons for the success are, first, improvement in service; second, lower maintenance costs; third, reduction in labor costs, and fourth, reduction in number of accidents.

Type of Bamberger Bus Used Between Salt Lake City and Ogden.

In the change to one man operation by the Bamberger Electric the equipment on hand was utilized in making over the two man cars into the one man operated cars. The equipment was repainted an entirely new color. The body was painted in what is known as the Pullman body green, while the uppers and trimmings are now a very attractive yellow. Not only the outside of these cars was repainted, but the interior was entirely changed with the painting of light colored ceilings and trimmings to match. The smoking compartment was changed from the front of the car to the rear. The rear vestibule platform was removed and in its stead was constructed an observation smoking compartment which provided for an additional seating capacity of eight passengers. The complete cost of changing the equipment from the two man to the one man operation, including inside changes, painting, etc., was approximately $800 a car.

One of the results of the change in color scheme has been the decrease in the number of accidents due primarily to the fact the new cars, under their present color scheme are visible at a greater distance, and naturally this feature would have the tendency to minimize the number of mishaps at the various crossings along the right of way.

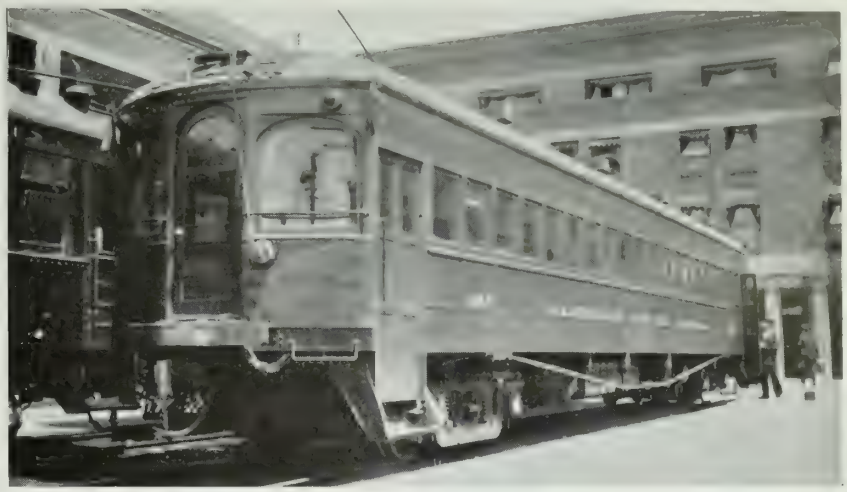
In connection with the safety features of this new equipment it has always been the policy of the Bamberger Electric, even with the two man cars, to provide what is known as the "dead man control." With this feature in mind on the one man car operation a safety treadle was installed on the air line, which operates as an emergency feature. In case the operator removes his foot the brakes would automatically be applied.

The equipment made over into the one man cars is of an average length, between 55 and 65 feet, the weight 40 to 44 tons, and each

of the cars is equipped with electric heat. The electrical equipment in these motor cars consists of four G. E. motors of 125 horsepower each, multiple unit control, Baldwin trucks and 36-inch standard steel works rolled steel wheels.

Prior to its adoption last May the one man equipment was for a number of days put in service with the motorman and conductor in charge of the car. This was done in order to direct the public as to the future one man operation, and familiarize it with the new method of getting on and off the cars. The one man operation went over big. The officials in charge were surprised by the manner in which the public received the new service. There was no confusion. The general rules covering the one man operation were learned quickly: You show your ticket as you enter at the front end. You leave the car at the front end. Let the operator know you are approaching your station by ringing the stop bell. Others can not get on while vestibule is blocked — please be seated promptly. When leaving the car, hand your ticket to the operator. That's all there is to it. There isn't any more.

Mr. Bamberger's foresight in original construction and location proved valuable when the paralleling highroad was completed between Salt Lake and Ogden. It not only permitted high speed passenger operation but the railroad already had begun the development of freight traffic. Only the publication of through freight rates with connecting transcontinental lines remained to make freight tonnage an important item in the earnings. This has taken some years of persistent effort, and although material assistance was obtained from the Railroad Administration during the period of government operation it was not until 1924 that the Union Pacific System joined in publication of a complete line of through freight rates with the Bamberger Electric, so as to permit an unhampered development of its freight traffic. This freight tonnage is growing rapidly. It includes not only the development of many industries along the line, but also the providing of valuable terminals at Salt Lake City and Ogden.



One of the New One-Man Cars, Bamberger Electric Railroad.

In Ogden a joint passenger and freight terminal is maintained with the Utah Idaho Central R. R., an interurban constructed in 1914 between Ogden and Preston, Idaho, a distance of 97 miles. Through freight, express and passenger service is maintained with this line. This terminal is conveniently and advantageously situated in the heart of the business center, in the same block as the United States postoffice.

At Salt Lake City the terminal facilities are operated by the Salt Lake Terminal Co., a corporation jointly owned by the Bamberger Electric and the Salt Lake & Utah Railroad, an interurban constructed in 1916 from Salt Lake City to Payson, Utah, a distance of 67 miles. In locating this terminal and the Salt Lake trackage Mr. Bamberger's foresight and faith in the future territory is again evidenced. The main line tracks are on a street just two blocks from the main business street of the city so that industrial spur tracks could be constructed and permit carload freight in standard railroad freight

Interior of One of the Bamberger Motor Buses.

cars to be placed for unloading just one block from Main Street, surely an asset not equalled in many places.

In addition to a conveniently located freight terminal there has been constructed at Salt Lake City a most attractive passenger station, costing about $250,000, ideally situated one block from Main street, adjacent to the Mormon Temple square, and convenient to the retail district. In addition to the station facilities a part of the building is used for railroad and other offices, drug store, restaurant, barber shop, and stores.

"The Bamberger Electric family" is a common expression among the road's employes. Some of these men have been with the company for more than 25 years, and in that time they have created an interest in the business that means peace. There is no red tape or departmental antagonism. The whole outfit works to develop friendships and traffic. Incidentally the employes have never found it necessary to organize. There has never been a strike on the road, and no labor committee ever has waited upon the management for any purpose. Julian M. Bamberger, president and general manager of the company, like his father, is democratic. He knows practically all the employes personally and most of their families. N. S. Wiltsie is general superintendent and Ray B. Needham, traffic manager.

Pullmans to Quit Mexico

The Pullman Company will withdraw all Pullmans from Mexico, beginning immediately, according to the statement of a high Pullman official at Mexico City. The step is taken to avoid cars being scattered all over Mexico when the advertised transportation-union strike takes place August 6.

A railway official said there is a possibility of the national lines operating without Pullman service for some time. Cooler heads here are attempting to patch the difference between the Pullman Company and the Traffic Labor Association, which already has complied with all the requirements of the law for declaring a legal strike. The labor union asserts that the strike will begin as advertised unless the Pullman Company concedes all the demands.

Women in Transportation

Transportation of merchandise is the most important thing in the economic structure of the world today and the women who understand the problem are the thinking women of the business world, Mrs. Mynoma De Groff, president of the Twin Cities Women's Traffic Club, told members of the Los Angeles Women's Traffic Club.

"In order to conduct our work we must have ideals and a definite objective in order to reach our goal of success," Mrs. De Groff said.

The speaker, who is traffic manager of Reinhard Brothers of Minneapolis, visualized the Minneapolis and St. Paul region as an immense inland seaport of the future with lines of commerce extending in all directions.

Mrs. Tress McMahon, traffic manager of the California Rock Salt Co. discussed the salt industry particularly as it affects California. Her address was one of a series of talks by members of the organization relative to their particular fields.

Miss Gertrude B. Sears, president of the local club, presided.

Ice Must Be Cheaper

California shippers of butter, eggs, cheese and dressed poultry will save several thousands of dollars yearly, through the action of the state railroad commission in ordering the Southern Pacific Co., the Atchison, Topeka & Santa Fe, Union Pacific System and other major rail line carriers operating within the state, to reduce the charges for refrigerating those commodities for intrastate shipment, on or before September 1.

Present refrigeration charges vary from $30 to $55 a car, according to the length of haul and the territory traversed. The commission has ordered these rates reduced upon the basis of the cost of ice used. The result will be that the charges on a carload of butter, eggs, cheese or dressed poultry will vary from a few dollars a car to a maximum of approximately $21 a car.

Ice will be supplied by the carriers at $4.50 a ton at all points in California, except in the Imperial, Coachella and Palo Verde Valleys, where the cost will be $6.50 a ton.

Few Meetings This Month

Not many meetings are scheduled for August for which, doubtless, railroad men will be thankful. Conventions during that month in Chicago are nothing to write home about. However, there are at least three courageous organizations determined to confer despite the weather. Among these are:

The American Railway Tool Foremens' Association, August 31 to September 2 at the Sherman Hotel, Chicago.

International Railroad Master Blacksmiths' Association, August 16 to 18 at the Hotel Lafayette, Buffalo. There will be an exhibit by the International Railroad Master Blacksmiths' Supply Mens' Association at the same time.

The Railway Car Department Officers' Association will meet at the Sherman Hotel, Chicago, August 23 to 25.

Argument for Hard Roads

A farmer in the South came to town a few weeks ago with a load of cotton. "Do you know," he remarked as he stood near the newly opened concrete highway, "I made the trip in a little under two hours this morning. It used to take me two days and a couple of plugs of chewing tobacco. This morning I made it with one chew."
—Building Materials, June.

When the Cantaloupes Go Eastward

An Imperial Valley Epic

By Charles James

TWENTY-FIVE years ago cantaloupe shipments out of the Imperial Valley were small items. One day last month a single Southern Pacific train of 149 refrigerator cars filled with this fruit was moved from Brawley to Yuma on the first lap of its journey to eastern markets. A mighty demonstration of three very important things: what can be done, by determined men, even in a desert region, such as the valley was in the beginning, the marvelous development in motive power since agriculture became a feature in that country, and the really fine results of cooperation and intelligent management by railroad men and shippers.

It is estimated the Imperial Valley will ship 17,000 cars of cantaloupes this season. Of this number 16,321 cars had been moved up to July 14 from Brawley and other producing centers. Last season the crop amounted to 14,144 cars, and in 1922, when the previous high record was established, 12,133 cars were marketed.

Southern Pacific Train of 124 Refrigerator Cars Loaded With Cantaloupes From the Imperial Valley for Eastern Markets

Since the very small beginning was made with nothing much but grit and hope the acreage has increased until today the valley has about 40,000 acres planted yearly to cantaloupes, something of prime importance to the eastern palate which demands its morning fruit regularly and wants it in good condition when it gets it. The human machines in control of these hypercritical palates imagine the most important thing a railroad does is to rush passengers over the country from coast to coast as fast as possible, with all the attention to comfort and convenience and schedule punctuality such organizations can achieve. Where the morning cantaloupe came from, how it was grown, who took it from the vine and shipped it to the eastern table, how it reached there fit to be eaten, or what it cost in sweat and almost endless toil, steam power, modern icing, millions of dollars of railroad equipment, but above everything else, the human organization needed to do all these wonderful things—to all or any of these interesting but tiresome details the average cantaloupe fiend gives no thought. The chances are he doesn't know much more about the story of his cantaloupe than he knows about his porterhouse steak, and that's nothing to worry over. His but to buy and eat.

In what are referred to gravely as the early days of the cantaloupe industry one seldom heard of anything except Rocky Fords,—musk melons, they were called—grown in Colorado. When the Imperial Valley appeared on the scene a big problem was presented. Comparatively speaking Colorado was Far North. Getting its melon crop

to market was almost easy. But in the valley the situation was distinctly different. The traffic called for the very highest degree of efficiency in operating conditions. There was no organization worthy the name. Men produced and peddled and did it as fast as possible. Refrigeration was scarcely started, and not so scientifically regarded on railroads as it is today.

W. C. Eaton, Agent at Brawley, Cal.

Year after year these railroads studied the problem of handling this highly perishable crop. Indeed some critical patrons believe they still give more thought to keeping the cantaloupes cool going over the desert than they give to passengers. But of course these cranky persons forget that when a cantaloupe is hot it's done for, while a human being is merely moist and grouchy. Then, again, all the great transcontinental carriers know that a car of spoiled cantaloupes means a claim or a law suit. But passengers—well, if any one imagines he can ride across this big continent in the summer without getting hot about it—on any railroad route—he's at perfect liberty to try. There's little choice.

Cantaloupes, and especially the Imperial Valley family, are the most finnicky tribe in the world. In the orderly processes of nature they are all ready for market at practically the same moment. They want to move, and they want to do it suddenly and fast. The whole outfit demands ice in large and chilling quantities. And in six weeks they have all disappeared or trouble ensues.

The working out of this big problem is a story in human relations. Nothing short of keen rivalry among the railroads, top notch facilities of every kind, the highest degree of intelligent loyalty and cooperation make such a job possible. Ben Baumann, Southern Pacific trainmaster at Brawley, Cal., for eight consecutive cantaloupe years—Ben can tell you; or W. C. Eaton, the company's agent at that point. But there are others, way up officials whose duty, ordinarily would not involve them with cantaloupes except at breakfast, general officers and "assistants to" and superintendents of this and that and the other thing.

Trainmaster Baumann

But all the engines and cars in creation couldn't move this perishable crop in jig time and keep it out of the claim department and the courts. It takes train crews of the right kind; it calls for men willing to shed their more or less white collars, men who are willing to forget the beaches and the golf courses and the nineteenth holes, and go down to the valley when the cantaloupes are yearning for a trip, and work day and night where the weather and everything else is hot. And there they stay until the crop has been moved on its way to the markets and the discriminating palates of the distant East.

The Southern Pacific put in a faster schedule than ever this season, a schedule that cut five hours from the run-

Pacific Fruit Express Icing Platform for 140 Cars on the Southern Pacific at Yuma, Arizona

One of the Mountain Type Locomotives Used by the Frisco Lines in the Long Runs Between Kansas City and Birmingham.

ning time between Brawley and Chicago. Five hours in the life of a cantaloupe may mean the difference between acceptable fruit and mush—a cantaloupe is a fruit, we hope. Seventh day sales in the Chicago market are now assured, with fast freight service that afternoon for the journey farther east.

Icing facilities have been increased. At Yuma the S. P. has an island icing platform more than 3,000 feet long and there every train of cantaloupes is reiced. One hundred and forty cars can be iced at one time at this platform, and with the most astonishing speed. The Pacific Fruit Express has icing facilities now at Tucson and El Paso equal to those at Yuma, with somewhat smaller plants at Phoenix and other points in the Salt River Valley of Arizona.

The real spirit of the men doing this important work was shown not long ago when the 25th anniversary of the cantaloupe kingdom was celebrated at Brawley. Shippers and railroad men gathered at a banquet and talked over the quarter century's work. There was a birthday cake for the occasion, too, specially prepared by the S. P. dining car department with an inscription in icing to honor Dodge Hale, the dean of cantaloupe growers. General officers were there representing the several departments, and more than 400 growers of the cantaloupe. Doubtless, in the words of the country editor, a good time was had by all, but a significant note was added by one man, a grower, with a human understanding of the real essentials. "It's a fine thing to see all these officials," said this philosopher, "but I never forget that after all the planning and scheming, the talking and the arguing, it's the superintendent and the trainmaster and his assistant and the crews that do the work."

Pretty good philosophy, we think.

Frisco Long Engine Run

Another advancement in American railroading has been recorded by the Frisco Lines in running that company's huge Mountain type passenger engines from Kansas City to Birmingham, 735 miles, without change. These engines, on the Kansas City-Florida Special, the Frisco's all year crack train, have heretofore been changed five times between Kansas City and Birmingham. In 1925 the company began a series of tests which have resulted in regular long runs reported.

The first run was made out of Kansas City June 29 leaving at 6:00 p. m. and arriving at Birmingham 3:17 p. m., the following day, three minutes ahead of schedule time. This train consisted of ten all-steel cars. In making this run, the engine consumed 32 tons of coal, which is equivalent to 8.7 lbs. of fuel per passenger car mile. Coal was taken four times on this run, the ash pan was opened five times, water taken ten times, and six engine crews and three train crews were used on the run.

The grades on the different divisions were from level track to the heaviest grade, which was 1.67 per cent grade. The speed, which includes all necessary operating stops, from Kansas City to Springfield, was 37.8 miles an hour for 202 miles; from Springfield to Memphis, 37.5 miles an hour for 282 miles; and from Memphis to Birmingham, 35.2 miles an hour for 251 miles. On the return trip, Birmingham to Kansas City, the train made an average of 37.6 miles an hour for the entire trip, 735 miles, which also includes all operating stops.

On this first trip, the engine was not cut off at any point over the entire distance, Kansas City to Birmingham, and aside from the operating stops, the following was the dead time at intermediate terminals between Kansas City and Birmingham; Fort Scott, Kans. 8 minutes switching train; Springfield, Mo., 30 minutes for connections from Oklahoma; Thayer, Mo. 5 minutes for water; Memphis, Tenn. 20 minutes switching train, mail and express; Amory, Miss. 5 minutes for water. There was no delay working on the fire at any time on the trip and none on subsequent trips. Out of 21

trips made since the beginning of these long runs, this train has gone into Birmingham on schedule or better.

The engine used was a Mountain type, No. 1527, with 54,100 lbs. tractive effort; cylinders 28 by 28, with 200 lbs. steam pressure; 69-inch drivers; total weight of engine and tank 591,810 lbs.; weight on drivers 245,170 lbs.; weight on trailer 57,700 lbs.; weight on engine trucks 55,820 lbs., factor of adhesion 4.55; grate area 70.3 sq. ft.; coal capacity of tank, 17 tons, water capacity of tank, 11,700 gallons. This engine was equipped with one of the latest type stokers, exhaust steam injector, low water alarm, lubricator and transfer filler, and syphons. This engine was equipped with grease lubrication for engine truck hub liners. It has 6¾ inch nozzle with ⅜ round bridge.

The grade of fuel used on the run was Alabama mine-run coal, which does not clinker bad, is easily fired and controlled, and is an ideal coal for long runs. On the first trip, this train was accompanied by the general road foreman of equipment, D. L. Forsythe, and traveling fireman, Joseph Ray. At the completion of the trip, the fire in this engine was in as good condition as it was the first 100 miles, and the engine could have been doubled back to Kansas City without anything being done to the fire, with the exception of opening the pan. There was no delay or trouble with the engine on this trip, or any subsequent trips.

The engine was equipped with a five-pint lubricator in connection with transfer filler, which holds 18 pints, making 23 pints of oil. In checking this over on arrival at Birmingham, it was found the engine had used 16 pints of oil on the first trip, on the second trip 18 pints, and on the third trip 20 pints.

The long runs have permitted a reduction of four engines from the number formerly required in this service. The lay-over periods at both Kansas City and Birmingham are sufficient to give the engine the necessary attention before again being dispatched on the run.

This, the Frisco reports, is not a spectacular run, but is the permanent, regular run in effect between Kansas City and Birmingham, and these engines will be run through in both directions every day on these two trains.

A comparison of the tremendous growth in locomotive power is significant in connection with this change. The 88-foot length of the present day Kansas City-Florida engine, from pilot to end of coupler, has supplanted the old 53-feet long locomotive which pulled this Florida train 25 years ago. The old engines weighed 137,300 lbs. as compared with the 582,000 lbs. of today's locomotives. The feeble 13,000 lbs. tractive effort of the old engines seems small indeed, compared with the 54,100 lbs. tractive effort of the locomotives which will make the long run.

For the present the Kansas City Florida Special will be the only train to be pulled the entire distance from Kansas City to Birmingham without a change of power, but Frisco officials say that at a later date the Sunnyland, companion train of the Kansas City-Florida Special will also make the run without changing engines.

At present other long runs on the Frisco Lines without engine change are made from St. Louis to Oklahoma City on the Frisco's "Meteor," 542 miles, and from Kansas City to Ft. Worth, 590 miles.

The Grape Car Plan

The California grape car plan will again be put into operation for the season of 1927 it has been announced by G. A. Leithner, district manager of the car service division, American Railway Association. With the exception of a reduction of four days in the time for filing advance notice for car requirements, allowing more flexibility and a benefit to the shippers, and a few other minor changes, the plan will be practically the same as operated last year.

The plan will function through the offices of a chief joint railroad representative with headquarters at 526 Wells Fargo Building, San Francisco, the American Railway Association having appointed Leithner to serve in that capacity. He will have sufficient men assisting him to act as joint railroad representatives at centralized points in each shipping district.

The grape car plan instituted last season proved successful in forming a basis for the equitable distribution of refrigerator cars as between grape shipping districts and shippers in California. Further, it was successful in providing an orderly and businesslike movement for the marketing of the 79 million dollar grape crop carried to eastern markets in about 61,000 refrigerator cars with the entire elimination of a car shortage.

The two main factors of the plan are the requirements for filing refrigerator car needs six days in advance of the loading date, and the requirement of a special surety grape bond from the shippers as was in effect last year. During 1926 there was a ten-day advance filing requirement. In the plan this year car requirements are to be filed Monday, with the privilege of modifying such requirements up to and including Friday of the same week, loading date beginning at 12:01 a. m., on the Sunday following.

"A fertile soil with industry, and easy transportation for men and things from place to place, make a nation strong and great."—Bacon.

The making of money, the accumulation of material power, is not all there is to living. Life is something more than these, and the man who misses this truth misses the greatest joy and satisfaction that can come into his life —service to others.—Edward Bok.

Something New in Car Building

Comfort, Efficiency, Safety

By Walter Kennedy

THE OLD fashioned, insanitary and decidedly uncomfortable bunk cars familiar to all railroad men in construction work, and other special duties, are being relegated to the scrap heap on the Union Pacific.

The Los Angeles & Salt Lake unit of that system has built recently in the Los Angeles shops 100 outfit bunk cars on 100,000-capacity steel underframes. These are different from any heretofore constructed. For one thing, instead of side doors there are vestibule platforms on the entrance ends. At the end opposite to that equipped as an entrance there is a door, but it is screened permanently. This permits adequate ventilation but also is a safety device preventing men from stepping out between the cars when the train is in motion, or out on their heads while the train is on a siding.

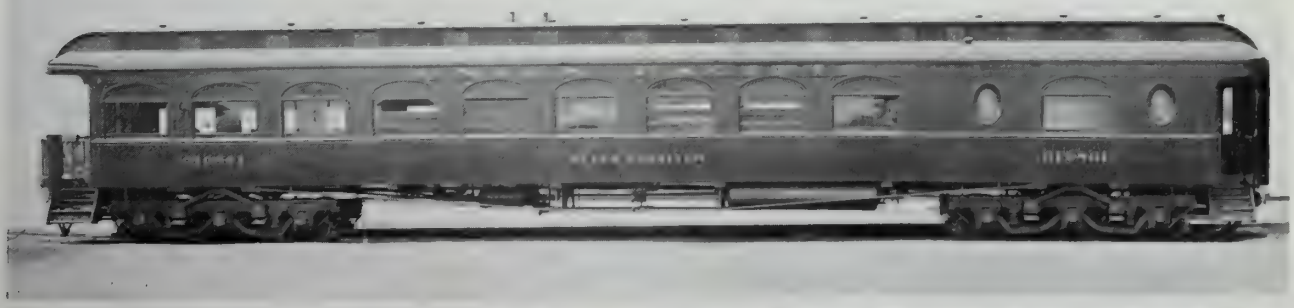
The kitchen or lounging room contains two tables, four benches and a stove. In the bunk or bedroom the cars are equipped with eight stationary steel bunks and eight individual closets or lockers so the men may have a private place for their belongings. The body is sheeted with red resin paper between the siding and lining. Windows and doors are screened. The cars are comfortable, safe and clean. The steel underframes and all round heavy construction serve to give the men occupying the cars a higher morale, a new respect not only for themselves but for the company's property. The men like the new cars and do their part in taking care of them. Moreover, the labor turnover has been very largely decreased wherever they are used.

The Rules Examiner's Car Showing the Instructor's Desks and Office at the Far End.

Nine steel drover service cars have been turned out by the same shops. These are on 100,000-capacity steel underframes, type D coupler, 10-inch air brakes with K triples. The superstructure or body is sheeted with red resin paper between the siding and lining, the same as the outfit bunk cars. Seats are built in. There are accommodations for sleeping for ten men. There are no removable or loose parts in the cars, and doors and windows are barred to prevent occupants from getting hurt. Indeed, the cars were designed with every possible precaution for the safety of the occupants.

Before these cars were turned out the Union Pacific had been using ordinary light passenger coaches for carrying stockmen but they were by no means so comfortable as the new kind. The new cars can be handled in any part of a train because of their solid construction.

Ten old passenger dining cars were retired recently and converted into dining cars for bridge and work gangs. These cars are equipped with large refrigerators for meats, vegetables, cream and other supplies, and have also a separate storeroom, living room, a large kitchen and a dining room. Overhead water tanks were installed and the stove was equipped to give an adequate supply of hot



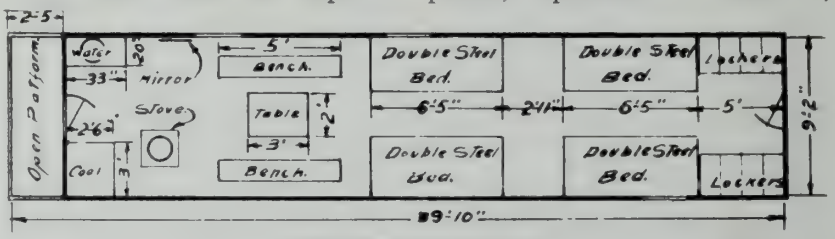
Note the Clear Cut Lines of This Car, and the Simplicity of Lettering. For a Wonder the Word "Car" Has Been Omitted From the Designation, the Union Pacific Officials Taking it for Granted That the Average Person Would Realize it Actually is a Car.

Vestibule Platforms Now on Bunk Cars.

water. A hand pump is installed on one platform to pump from water supply cars into these overhead tanks where gravity is used. Windows and doors are screened so that the cars are exceptionally comfortable and pleasant for the men.

One of the old 78-foot parlor cars was converted recently to suit the requirements of the rules examiner. This car is divided into class room with charts, miniature signals electrically lighted, and miniature tracks with small flags so the instructor may allow students to do the flagging themselves and receive practical instructions if they need them. A small private room was fitted up so the instructor may give personal help to any men needing it, apart from the class room. There are state rooms for the instructor and the secretary.

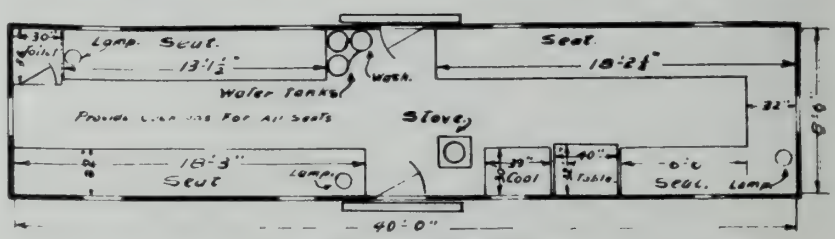
No dining facilities are provided for the rules examiner, the theory of the road being that if a man lives on the car and batches his efficiency and mentality become lower than if he is required to live elsewhere, getting both exercise and better contact with the people in the towns where he stops.



Floor Plan of Bunk Car.

This rules examiner car already has demonstrated its practicability. So many employes have talked about the company's part in equipping it properly that an unusual interest has been created resulting in regular attendance at lectures wherever the car may be. In a way the examiner's car is on a par with air brake instruction car designed and built in the Los Angeles shops, described in an article in this magazine for June.

The shops also have turned out a scale inspector's car, two cars for the electrical road gang and others for the maintenance of way department.

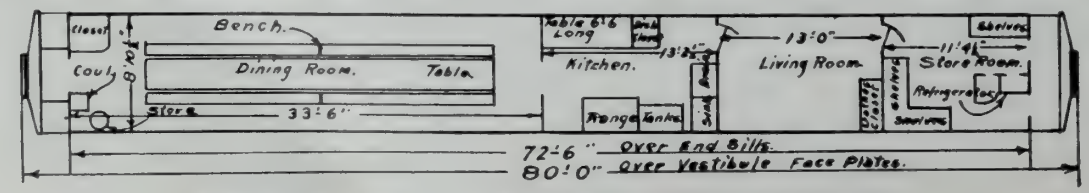


Plan of Modern Drovers' Car.

B. & O. Centenary Progress

The big transportation spectacle now under construction at Baltimore for the exposition and pageant of a century of railroading, which will be the largest and most complete of its kind yet undertaken, is rounding into shape. It will commemorate in the two-week period, September 24-October 8, the centenary of the Baltimore & Ohio Railroad founded in 1827.

Although the opening date is nearly two months away, the Hall of Transportation is practically ready for the exhibits. The old tavern, an interesting replica of an



Showing Arrangement of Outfit Dining Car With Construction Gang.

early day inn on the National highway in Maryland, which will be used as an Administration Building, is having the finishing touches put on. The Allied Services and Traffic buildings are about three-quarters completed. The grandstand material has been made and will be in process of erection shortly. All grading has been finished, the railroad track laid, and the landscrape work is about ready to be started.

To display properly the growth or only the major developments connected with the iron horse and its world, it has been necessary to build a Hall of Transportation, a

Interior of Bunk Car Showing Lockers at the End, Steel Double Deck Bunks, Tables and Benches.

museum in fact, where old wooden, and new steel rails, antique granite-slab, and modern chemically treated ties, and the by-gone relics of couplers, and the automatic safety ones of today, models of ancient and modern bridges of various styles, not to mention the many, many other accessories likewise to be shown, will depict graphically in their respective lines railroad progress in the century. Gone are the box-like cars drawn by horses with which the Baltimore & Ohio began operation in 1829, but a replica of one of these old timers will show it contrasted with the individual-seat coach of the modern train. From the pilot of the engine to the caboose or observation car will be portrayed from the beginning to the present day, all the appliances and appurtenances by which the railroads grew from a tiny double streak from Baltimore to Ellicott's Mills, 13 miles by 1830, to the net-work of more than 250,000 miles of steel-railed, ballasted road-bed over

Wide, Comfortable, Leather Cushioned Benches Makes This a Rather De Luxe Observation Car for the Drovers Despite the Window Bars, Which, of Course, Prevent Anyone Being Injured When the Windows Are Open.

which roll the servers of 120 million people.

The most powerful type of locomotive ever built for an English railroad, capable of running 80 miles an hour, will be sent to Baltimore, Maryland, from London, by the Great Western Railway of England to be one of the many locomotive exhibits.

This is the first time since the World's Fair at Chicago in 1893

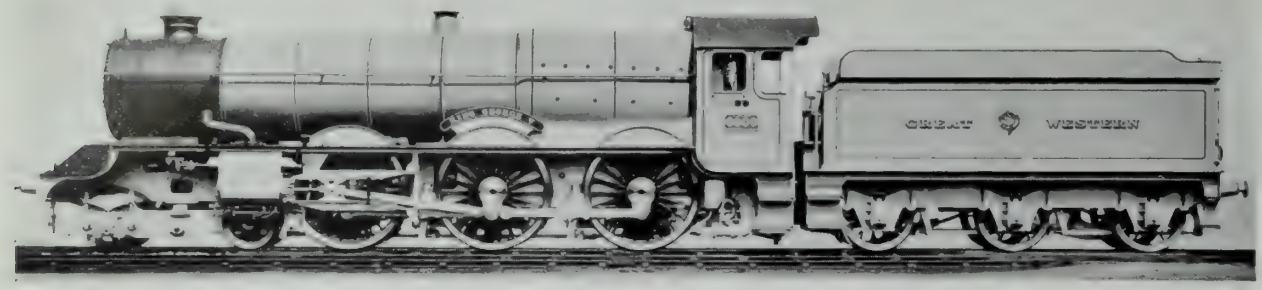
This Shows Method of Applying Interior Sheathing to Reinforce the End of the Bunk Car.

that an English locomotive has been sent across the ocean to take part in an American festivity.

The opportunity thus afforded Americans to see without going abroad, the most modern of English locomotives was provided by the Great Western Railway through the courtesy of Sir Felix J. C. Pole, general manager, who from the beginning has expressed great interest in the Baltimore & Ohio's centenary celebration. The history of the Baltimore & Ohio, in one important particular, is peculiarly like that of the English railroad, both being continuously operated under their original charters, the Baltimore & Ohio's dating back to 1827 and the English company to 1833.

The engine Sir Felix is to send over for the Baltimore & Ohio's centenary celebration, is now un-

Showing the Side Door and Hand Rail Devised to Prevent the Festive Drovers Climbing to the Top of the Car While the Train is in Motion. Of Course, There Are No End Doors to Make This Possible.



The King George V, Which the Great Western Railway is Sending From England for the Baltimore & Ohio's Centenary Celebration.

der construction at the Swindon works of the Great Western and will bear the name of the reigning monarch of England, King George V. It will be the first of 20 known as the King class, each one being named after an English monarch, similar to the Baltimore & Ohio's President class named after the first 20 Presidents of the United States.

Technically, the King George V, as well as the other 19 royal locomotives, will be of the 4-6-0 express type of four cylinders, weighing 135.7 tons. They will be of 40,300 pounds tractive effort, with total length of engine and tender 68 ft. 2 in.

The Great Western Railway states that the 20 engines will be finished in the same style as that adopted for others already in its fast passenger service, bright green with brass and copper trimmings, giving them an attractive appearance.

Nearly One Mile of Pipe Line is Installed in the Sides and Ceiling of This Car for Giving Instruction in the Operation of Air Brakes on the Union Pacific.

Keeping the Fruit Crop Cool

Vegetables, Too, Need Scientific Care

By E. F. McPike

LIKE many of the very important things we are doing today in industry, refrigeration is only an improvement over a process used a long time ago. The East Indians and the Romans cooled their wines by a crude method of liquefaction, and the Spaniards, Mexicans and American Indians, as travelers know, have used much the same simple means in achieving low temperatures for food preservation perhaps for centuries. Only in recent years, comparatively, has refrigeration become a scientific study on a profitable commercial scale.

The Illinois Central was the pioneer railroad in the handling of fresh fruits under refrigeration. About 1872, refrigerator cars began to be used for handling strawberries under ice from points in Southern Illinois to Chicago and other markets. This was after a long series of experiments with other methods.

In 1866 twelve large refrigerator boxes for shipping strawberries were constructed by a shipper at Cobden, Ill., and were used in forwarding such shipments by express from points in that vicinity to Chicago and certain other points. Each box had a capacity of 200 quart baskets of berries,

Illinois Central Icing Yards at Waterloo

100 lbs. of ice, the total weight being approximately 600 lbs. to the box when loaded. These experiments were fairly satisfactory when the express companies re-iced berries in transit. Occasionally, however, the necessary re-icing service was overlooked. This plan finally was abandoned by the shipper. A couple of years later experiments were made by shippers at Cobden, Illinois, with berries loaded in an insulated car which originally was designed for handling beef and fish under refrigeration. In each corner of this car there was an upright cylinder having a diameter of about 15 inches, so that ice and salt could be placed in the cylinder from the roof of the car. This method, however, caused the freezing of a part of the berries while the remainder was cooled unequally. On account of the resultant losses, any further ventures of that kind were discouraged. In 1869, a shipper at Cobden secured a car from an eastern railway, constructed for the handling of dairy products under ice. This car had an ice box in each end, with a total capacity of two tons of ice.

The next experiment made by certain shippers in Southern Illinois was in the building of a cooling room in the packing shed to hold the berries 24 hours to pre-cool them before sending forward by express. Quite satisfactory results were obtained in this way but, ambitious to make further progress, a refrigerator car of the old Tiffany pattern with V-shaped ice boxes suspended from the roof the entire length of the car, was obtained

for handling berries. Only one and one-half tons could be put into the ice pan and this was not enough to remove all the field heat from a carload of berries, and maintain refrigeration. Therefore, the shippers constructed a cooling house sufficiently large to hold ten tons of strawberries, which were cooled down 24 hours, and then loaded into a Tiffany car at about 50 degrees Fahrenheit. Better results were thus obtained than from any previous efforts, and the berries arrived in Chicago in first class condition. Successful experiments in this manner began about 1872. The shippers in Southern Illinois, however, sought a refrigerator car that would hold several tons of ice so that the berries or fruit could be loaded immediately after picking, and be cooled in transit. We see thus the origin of the modern, well built, well insulated car, with adequate capacity for ice. Numerous shipments were made in such cars from different producing districts in Mississippi and other states, finally resulting in the handling of peaches from California satisfactorily over the long haul to Chicago and other eastern markets.

Ever since the Illinois Central opened its Omaha-Council Bluffs-Chicago line, it has given special attention to the handling of the California fruits and vegetables for points on or reached via its rails. Train schedules, icing facilities, supervising forces, have been arranged with due regard to the satisfactory handling of this important traffic. The Illinois Central has followed the policy of keeping its route open at all times to help the California shippers to reach eastern markets. During the labor troubles in 1920 and again in 1922, the Illinois Central kept its line open regularly for business and took care of the large volume of California shipments offering. This action was much appreciated by the fruit and vegetable shippers in California.

Adequate icing facilities are maintained at Waterloo, Ia., for the efficient and rapid re-icing in transit of cars of perishables from the West. Waterloo is a division terminal and the most convenient point at which to do the re-icing of such cars.

To all this business there is, of course, another side that may be called economic, and concerning which we cannot do better than to make the following extract from an address before an association of fruit and vegetable shippers, in January, 1925, by Charles H. Markham, then president, now chairman of the board, of the Illinois Central:

"We are accustomed to credit the unity of our national life to the political idea upon which our government was founded, but I venture to say that our unity is not essentially political, but economic. We are a united nation, in contrast with the unorganized European states, largely because the development of our economic life has been national—along lines that have been influenced to a great extent by the far-reaching, well co-ordinated service performed by our railroads. In 1910, Mr. Franklin K. Lane, then a member of the Interstate Commerce Commission, returning from the International Railway Congress in Berne, Switzerland, made the significant comment that 'our railway system is without parallel in the world, because we are living as a nation, and in Europe, they live as communities.' Turning this around, it might be said that we are living as a nation in contrast with the community life of Europe, because of the service that has been developed and is being performed by the railroads. I mention these things not to persuade you to believe that the business in which you are engaged owes a great deal to the railroads for what they have accomplished in the past, but to remind you that the future welfare and prosperity of the railroads is a matter of great concern to you as business men."

W. J. Wilson, of Newcastle, Calif., whose father shipped the first full car of fruit from that city, over the old Central Pacific lines, more than sixty years ago, has announced his retirement from the fruit business. The pioneer car, the forerunner of the present extensive fruit industry of that district, was a common box car with iron gratings for ventilation, and was shipped to Denver.

Dispatching by Telephone

Class I railroads in 1925 had 132,850 miles of telephone lines, used for the transmission of train orders, an increase of 13,000 miles compared with 1920. Telegraph lines used for such purposes in 1925 totaled 121,521 miles, a decrease of more than 13,000 miles compared with 1920. The use of the telephone in place of the telegraph for handling train orders was sanctioned by the American Railway Association in November, 1908. Prior to that time the telegraph was the principal means of communication. Since 1908 the development of the telephone service on the railroads has been rapid. Orders regulating train movement and also general communications are now handled largely by telephone.

Forest Fires Are Costly

Forest fires caused by carelessness may make kindling wood a luxury 100 years from now, says W. H. Kirkbride, engineer of maintenance of way and structures for the Southern Pacific. Class 1 railroads spent $186,291,000 last year for the direct purchase of about 15 per cent of the total timber cut of the United States. Indirect purchases brought the railroads' consumption of forest products in 1926 up to approximately 25 per cent of the country's entire output.

"Because of these huge expenditures the railroads regard fire prevention extremely important," Kirkbride said. "But the average citizen should be no less concerned, for if forest fires continue on the present scale wood eventually will become so scarce as to make almost prohibitive many commonplace articles now regarded as necessities."

The easiest thing to lose and perhaps the costliest—is one's temper; while he who practices courtesy and imparts cheerfulness adds to the wealth of the world.—Fifth Avenue Coach Company, New York.

There is no calamity which right words will not begin to redress.

Rough Handling, the Big Problem

Improper Packing a Cause

By B. A. Podlech

Santa Fe System

THE largest item confronting rail carriers today is breakage on fresh fruits and vegetables. Out of a total of $8,293,529 paid for loss and damage on these commodities in 1926, we find 43 per cent or $3,603,780 charged to breakage represented by rough handling and unlocated damage. In 1925 there was charged to these two accounts $3,361,663, or 38 per cent of the total. An increase during 1926 of $242,117 or 5 per cent. Damage reports from destination carriers for many years have, in the majority of cases, ascribed breakage as being due to shifting of loads, failure to nail strips or apply bracing properly, and Pacific Coast carriers have been carrying on an intensive campaign with shippers and have increased their field supervision to such an extent that it is now believed, generally speaking, the cars are leaving shipping points in good condition. The general question of controlling rough handling is in carriers' hands and should continue to be handled vigorously, particularly at those places where reports indicate breakage is the heaviest.

At present Pacific Coast carriers feel there are two items contributing largely to the heavy damage on perishable freight that have not received the attention in the past that their importance warrants. These are inspections en route and improper handling at destinations.

It is noted that, usually, the more times a car is diverted en route, the heavier the breakage is at the final destination, and actual tests made have developed that a shipper who has a regular market for his cars and who files no diversions, seldom has any breakage, whereas shippers filing diversions usually have some breakage on every car diverted. This indicates that persons inspecting cars en route are not complying with tariff requirements.

The Deplorable Result of Amateur Packing of Household Goods.

Rule 100 of Perishable Protective Tariff No. 3 contains the following:

"Wherever sampling or inspection of perishable freight in carloads is permitted (See Rules Nos. 130 and 135), the following provisions will govern:

"If original packages, stowing or bracing are disturbed by much sampling or inspection, then the person so sampling or inspecting must at his expense recooper, restow, restrip and rebrace the load in the original condition and remove all refuse from the car.

"Shipments will not be entitled to or receive reconsigning or stopover privileges (where otherwise authorized by tariffs) unless or until they shall have been placed in the condition outlined."

During the past year numerous reports have been received by our loss and damage department covering cases where damage, also shortages from packages, has been attributed to inspection and sampling en route. The claim department tells us it is incumbent upon carriers under the rule quoted to police this matter, and see that when the loads are disturbed they are replaced in proper condition. There does not appear to have been much improvement in the situation, and some uniform action should be taken by interested carriers to remedy the matter.

It is suggested that in all cases where inspections are made on team or hold tracks, that the following should apply.

1. That no cars be allowed to be opened or inspected without proper authority and that agents, when receiving this authority, in all cases delegate one of their representatives to accompany the persons making the inspection, and see that rule covering is obeyed.

2. Where boxes are opened and samples removed, they be marked by railroad representatives with marking crayon, "Inspected," also place and date, and notations should also be placed on waybills covering when possible to do so without delaying forwarding of the cars.

It is believed that if the foregoing records are maintained and

—An address before the Freight Claim and Claim Prevention convention at Quebec, June 17.

The Latest Method of Securing Barrel Shipments to Prevent Damage.

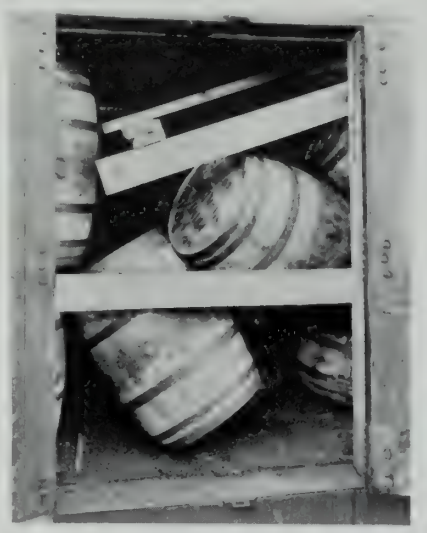
more careful policing given by carriers, there will be a marked decrease in our breakage account, as there is no question that failure to comply with tariff requirements is causing considerable damage that carriers apparently should be able to control.

When shippers are approached in connection with investigations of their loading, many of them tell us that they themselves have visited some of the large marketing centers and, unknown to carriers, have observed improper conditions that are resulting in heavy breakage as well as loss and damage to their products.

In order to satisfy ourselves that the handling received at destinations is a large contributing factor to breakage, the Santa Fe Coast Lines prepared, last year, a statement showing their breakage claim payments by destinations on all fresh fruits, vegetables and melons shipped over our line during 1925. This statment shows a very wide range of figures, varying from 36 cents a car on grapes at Kansas City to $66 a car on the same commodity at Buffalo. The farther east we went from Kansas City the higher the claims, indicating that the bulk of the damage is happening after the cars leave Missouri River territory. We found an average claim payment per car as follows:

Grapes	$ 2.80
Deciduous fruit other than grapes	7.27
Citrus fruit	10.87
Cantaloupes	12.42
Lettuce	4.98
Other vegetables	4.00

As it is our understanding that more cars of grapes are handled and unloaded by consignees on team tracks than any of the other named commodities, the lower average obtained on grapes strengthens the belief that the bulk of the breakage is occurring on cars unloaded at wharves or auction houses where the work usually is performed by contract labor.



The Old Method of Bracing Barrels with Wood Bulkheading, and the Inevitable Results.

The statement shows there are eleven destinations where investigations should be made to develop whether anything is wrong in the handling, and by this should not only be included the unloading but also the class of switching service performed, the proper recoopering of broken packages so they can be placed in the good lines and a careful investigation to determine whether reasonable amounts are being secured for salvage.

The destinations involved named in the order of highest average the claim payments per car on all green fruits, melons and vegetables are:

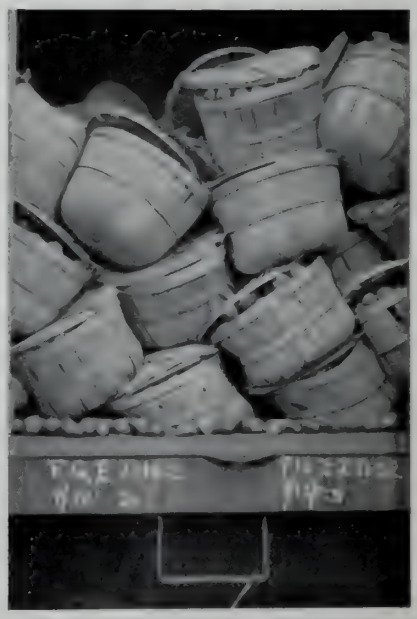
Buffalo	$20.51
Duane St., N. Y.	8.13
Boston	8.08
Chicago	7.69
Baltimore	7.12
Cleveland	6.54
Cincinnati	5.30
St. Louis	4.89
Philadelphia	4.88
Pittsburgh	4.21
Detroit	3.81
Chicago (AT.)	1.71

The last is quoted to show that due to the vigorous efforts of the Chicago claim conference, conditions at the Chicago auction houses were improved, and according to the foregoing figures have a lower average than at any other place. How they went about this, and what was found in their investigations is a matter of history with which most of us are familiar. It appears that we have two important features, inspections and handling at destinations, to specialize on, and without letting up on the loading or the rough handling I firmly believe that if the proper attention is given them, our next year's figures will show a marked reduction in our breakage account.

A Definition of Happiness

What is happiness? It is the thing we begin to seek from the time we are born until we die.

In the safety game we can meet everybody on the same foundation. A man who isn't sold on safety is divested of all that is good and beautiful in the world.—From the "Ethics of Safety," by Thomas Carrow.



Poor Containers, Bad Loading, No Bracing, and a Little Rough Handling.

—Herbert Photos

An Unusual Snapshot of a Junker Plane in Service Between Amsterdam, Holland and Malmo, Sweden. Fifty-Nine Men Standing on the Wings.

National Air Express Next Month

Railways Also Have Plans

By W. H. Harper

YOU have to rise early, these days, and stay on the job until late at night to keep anywhere near current developments in aerial transportation. It was slow enough, goodness knows, in getting started, at least in this country. Round-the-world flyers helped some in stirring the public interest, but it needed the picturesque Lindbergh with his solo flight, followed by Chamberlin, and Byrd with his gallant crew, to wake the peculiar American fancy.

And it certainly is staying awake. The American public may be just a little timid for a while about getting into the air, but at least it is studying the latest rapidly growing industry, and when the American public does this, something usually happens.

E. H. Stevens, superintendent of claims for the American Railway Express, said in this magazine, last month, that his company was preparing a coast-to-coast aerial express service. Contracts, he said, were being negotiated. Now the story has been confirmed and amplified by the company's president, Robert E. M. Cowie. Mr. Cowie says that after September 1, packages intrusted to his company in New York will be delivered on the Pacific Coast the morning of the second day. This will be a regular performance in the future, Mr. Cowie promises. He has just signed contracts with four air transportation organizations to give the service.

At present it takes four days at least to bring express from New York to the coast. The new service will put the Pacific region as close to New York as Chicago now is, speaking in terms of days of service. The express company's contracts are with National Air Transportation, Inc. for express from New York to Chicago and Dallas; with the Boeing Air Transport from Chicago to San Francisco by way of Salt Lake City, and with the Western Air Express from Salt Lake City to Los Angeles.

"In five years air planes will travel 500 miles an hour" Mr. Cowie says. "It is only a question of greater engine power."

The full import of Mr. Cowie's announcement may be more fully understood when one realizes that this great company now making the first venture of the kind in air service, has 28,500 offices in the United States with 125,000 employes, and a monthly payroll of $10,000,000. Transportation of perishable fruit is to be a feature of the new air service. The rates will be in keeping with the value of the merchandise to be transported, out-of-season fruits, other delicacies, women's costly gowns to speed styles, news motion pictures, and so on.

Railroad managers who may have been a trifle reluctant to admit the fast-approaching popularity of aerial travel, will do well to read this next paragraph. It is a prophesy by President Cowie of the American Railway Express Co.:

> From now on the big development of transportation will be in the air and the American Railway Express wants to prepare in advance. I list the transportation of express packages first in the development of commercial aviation, transportation of mail second and transportation of passengers third. The automobile has cut into the business of the railroads and express companies, but that will be changed by aerial transportation and we shall be prepared.

Railroad-Air Service Coming

Five of the country's leading railroads have been figuring carefully for months over plans to supplement rail with air service. The executives, with characteristic reticence, have refrained from disclosing their plans, but the news reaches the public in an authoritative way through the admissions of William P. MacCracken, Jr., assistant secretary of commerce, Washington. Mr. MacCracken says:

"Five large railroad companies

have been in conference with me for some time considering supplementing their rail with air service.

"Recent flights have aided in proving to more skeptical railroad officials that air passenger service is not a mere fancy but highly practicable. The air mail has proved a great success, and I have no doubt that air routes for carrying express within a year will be as successful.

"Definite plans for carrying express have been made by the American Express Co. Railroad officials have recently agreed to this arrangement. Air passenger service is next, and marked progress in supplementing rail service with air lines should be seen within a year."

Secretary MacCracken outlined the three possible methods by which railroads could assist in the development of our air transportation system: by owning and operating planes; by supporting a single, nationwide air transport company by contracts such as those they have with the Pullman Company; by establishing through rail-and-air rates, and soliciting traffic for air lines at points not on the air route.

Up to the present only one railroad executive has suggested the Pullman Company as an air line organization cooperating with railroads. This was President Atterbury of the Pennsylvania Railroad who said:

"It is by no means clear that the railroad companies themselves would be the best agencies to conduct the air service. There is much to be said on behalf of an independent agency working in harmony with all the railroads, as in the case of the Pullman and the American Railway Express Company.

"For instance, the location of rail lines has been largely determined by the topography of the country. It may be inferred that one of the benefits of air service lies in the ability to make short cuts and establish direct lines of communication between centers now linked only circuitously by rail. Such centers may be and often are, on the lines of totally unrelated railroads.

"To many minds it might seem

—Herbert Photos.

The Modern Airplane Pullman in Germany. This is a Junker Type G-31, Passenger Plane in Regular Service on Longer Flights.

that an independent agency with a national field of operation would be in better position to provide such service than an individual railroad corporation, necessarily identified in interest with the particular region it served."

Mr. MacCracken says further:

"The railroads will sooner or later be forced into supplementing their rail service with air service. It is a question as to whether they will go into the field now or later. If the railroads do establish air lines to supplement their rail service they probably will do it in conjunction with the air transport companies, merely taking care of selling of tickets, necessary business and administrative work, charging transport companies a fee for their work.

"Greatest need for the fruition of great passenger air lines is a large administrative organization to carry on routine work of selling tickets and caring for the business end of the enterprise. The railroad logically fulfills that mission and is therefore best fitted for successful establishment of great passenger lines through the air."

Rates for Air Mail Express

Rates on the new air express, which will begin operation Aug. 15, have been announced by the National Air Transport Company, which is operating in conjunction with the American Express Company. The Chicago to New York and Chicago to Dallas district, with intermediate points, has been divided into four zones. The rate on the first zone, with a radius up to 500 miles, is 15 cents per quarter pound, with a minimum of 90 cents. Second zone, 500 to 1,000 miles, 75 cents per quarter pound, minimum $1. Third zone, 1,000 to 1,500, 40 cents per quarter pound, minimum $1.60. Fourth zone, 50 cents per quarter pound, minimum $2. The rate, of course, will vary on packages of extra large cubic contents.

Passenger Service to New York

The Chicago Tribune says that city is to have regular regular passenger service through the air to New York within a few months. The trip is to take only 7½ hours and will be made by daylight in three-motored planes. The multi-motored planes have a factor of safety which will appeal to the public. When the engine of a single-motored plane like Lindbergh's refuses to function the best the pilot can do is coast to the best landing place he can find. When one or even two of the engines of a multi-motored plane are out of business the pilot still can keep his course and pick his landing place. Emergency landing fields along the route, particularly where it crosses the mountains, will also add greatly to the factor of safety.

All American Air Mail

Washington reports show the Key West-Havana air-mail route, for which Postmaster-General New has just awarded a contract to the Pan-American Airways, Inc., of

New York, is the first step of a 1555-mile Central and South American air service for mail and passengers.

The proposed service would link up the United States, Cuba, British Honduras, Guatemala, Salvador, Honduras, Nicaragua, Costa Rica, Panama and the Canal Zone and make connections with steamship services to the west and north coasts of South America, saving passengers and mails considerable time by placing them in New York in about four days from Panama. It is contemplated operating a tri-weekly service between Panama and the United States, thereby giving passenger and mail service to the Central American countries which are now depending on weekly or fortnightly steamship services.

Operation of the Key West-Havana air-mail service will be ready to begin about October 1.

Airport on the Roof

Word from Washington indicates the government, usually rather backward about moving forward, is preparing to keep abreast of air travel requirements. A six-acre airport will be provided on the roof of Chicago's new postoffice building, according to plans announced by Acting Postmaster John H. Bartlett. The roof will be a level concourse free of obstructions so that air mail planes can land or take off from it, Bartlett said. At one end there will be a sloping elevation or runway to assist planes in getting into the air.

The new postoffice will be a model for subsequent buildings in other great cities.

Pacific Coast Airports

With those finished in July and August 31 new intermediate air fields and airports will have been dedicated on the Pacific Coast. According to G. K. Spencer of the publicity committee of the National Aeronautic Association, the opening of these fields represents the greatest forward move in the arrangement of aviation facilities ever achieved in a similar territory since aviation began.

Oakland completed its municipal airport just in time to be used by Lieutenant Maitland in his hop-off with the tri-motored Fokker plane on his non-stop flight to the Hawaiian Islands. The runway at this airport, 7000 feet long, was completed in 14 days by a fleet of Caterpillar tractors, graders, road rollers, land levelers and harrows.

Mills Field, the San Francisco municipal airport, is unique in that except the concrete floor of the hangar, everything on the field has been designed to permit easy removal to whatever site the city may select a year from now as its permanent airport, should another of the nine projected sites be disclosed to have better meteorological conditions for flying. The Mills Field surface and drainage are unusually good, assuring that no planes will be wrecked by running into soft spots when landing. The lighting includes white boundary lights mounted on low staffs all around the field, red lights on all obstructions in the vicinity, and green lights over the most favorable approaches. A standard 24-inch beacon is to be mounted on the hangar, and both hangar and administration building will be flood-lighted with two mail lights each with a capacity of 30 million beam candlepower. These will be so mounted as to illuminate any chosen part of the field, according to the wind direction.

— Herbert Photo.

Interior of a Rohrbach-Roland Tri Motor 10-Passenger Cabin. An Aerial Parlor Car.

How the New Municipal Airport at Oakland was Leveled. This Runway Is 7,000 Feet Long and 150 Weet Wide.

Sky Anchors for Radio

The navy's bureau of aeronautics is working out a scheme to keep the radio antennae in the air after a flyer descends. A four-foot kite has been developed with enough lift to raise 500 feet of wire. The aviator driven down in a barren region can fly his kite and get into touch with the world, providing he can get enough wind and room to raise his kite. Once in the air the kite works very well.

To Speed the Hop-Off

A device by which, it is asserted, an airplane can be launched in one second with 100 feet of runway is announced by C. Francis Jenkins, Washington inventor, who recent-

ly evolved a reversible propeller attachment to permit a plane to land on roofs and other restricted areas.

Explaining his more recent invention, Jenkins said the plane is hauled by motor to the top of a runway 32 feet from the ground and then released, its wheels and tail skid being set in channels of such an angle that the plane is thrown at once into a natural nose dive.

Falcon Flyers to Meet

The board of governors of the Falcon Flyers will meet Monday night, August 8, at the Athletic Club, Los Angeles.

Falcon Flyers is an organization formed recently in the interest of aviation. Energetic business men of the Pacific Coast are included in the list of officers and charter members whose intention at present is, among other things, to have a country club, and also to encourage every form of legitimate publicity to promote aviation.

To Chicago in 20 Hours

Twenty-hour mail and passenger air service between San Francisco and Chicago began operation August 1 with reservations ten days ahead. Of course you have to be all-fired anxious to get to one of these cities when you pay the $200 fare, but if it really is important that you get there, why $200 isn't much.

Leaving San Francisco in a Boeing airplane at 7 a. m. the passenger will arrive in Chicago 20 hours later, a saving of 46 hours over the train ride.

By means of the new service, it is possible for the San Franciscan to pass a week-end in Chicago as easily as going to Santa Cruz or some beach resort.

One can leave at 7 a.m. Saturday, arrive in Chicago at 5:45 a.m. Sunday, play around until 3:30 p. m., climb back into the plane and be at his desk in San Francisco at 4:30 Monday afternoon.

There are three changes of planes on the trip—Salt Lake City, Cheyenne and Omaha.

The first passengers to be carried on the scheduled passenger time were W. G. Herron, vice president of the Boeing company in charge of traffic, and John Monk Saunders, motion picture scenario editor.

Air rates to Reno and other points in the West have been set at only slightly more than train rates.

Since the Boeing Company took over the transportation of air mail July 1, their planes have traveled 124,000 miles.

The Motor's the Thing

It is important to remember that all the transocean air flights from Lindbergh to Smith have been made with the Wright Wirlwind motor. This is an American product. It is interesting also, without any intention of being unfair about it, to refer to the experience of the two English airmen who, on the very day of Lindbergh's flight tried to hop from England to India. If they had succeeded they would have beaten Lindbergh's record. But the "if" in their case was their motor. It was a Rolls-Royce Condor, probably the best of the English long-distance motors. It failed them, and they fell into the Persian gulf. It was a heart-breaking failure. They had already flown almost as far as Lindbergh's total, and they had plenty of gas left to reach India. Their motor did not see them through. The Wright Whirlwind saw Lindbergh, Chamberlin, Byrd, Maitland, Smith through to the end.

Ford Monoplane Arrives Casually

If an airplane carrying passengers from Detroit to Los Angeles arrived safely after an uneventful trip, say about a year ago, the newspapers would have issued extras. Such an event took place July 27, and the story was printed on page 8 in the leading morning paper.

Breakfast in Chicago; luncheon in St. Louis, dinner in Kansas City; breakfast in Denver, luncheon in Salt Lake City, dinner in Williams, Ariz.; breakfast in Las Vegas, Nev., luncheon at Riverside, and a mid-afternoon arrival in Los Angeles.

This is the schedule the great Ford-Stout all-metal monoplane reported after a speedy, uneventful, comfortable and, according to the passengers, intensely interesting voyage from Detroit.

Among the passengers who arrived in the giant monoplane was J. Parker Van Zandt, general manager of Scenic Airways, who came to study air routes over the Grand Canyon and other western scenic marvels over which sightseeing airplane service is to be established shortly. Other passengers were W. B. Mayo, chief engineer of the Ford plant, and Edward B. Hamilton, superintendent of the Ford airport. They declared that the nationwide awakening of interest in aviation is tremendous, and that another year, or even a few months, will see many new airways opened and planes regularly flying between many cities.

The trip west was a perfect flight, said the passengers, Lawrence Fritz, the pilot, and Jack Wiles, chief mechanic. The three engines functioned perfectly and the big ship proved thoroughly airworthy.

The ship is built of duraluminum that glitters like silver in the sun, and is powered with three whirlwind motors. The pilot's seat is in the nose of the ship, comfortably inclosed, and the passenger cabin, holding twelve, is furnished luxuriously.

Loose End

The part of the automobile which causes more accidents than any other is the nut that holds the steering wheel. — Transportation News.

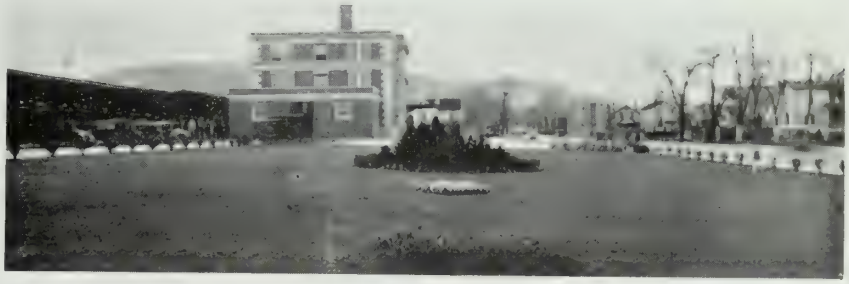
Public Relations Through Flowers

Beautifying the Stations

By Arthur Welby

THE Chesapeake & Ohio has assumed as one of its obligations to the communities it serves, and to the traveling public, the improving and beautifying of the grounds around the stations and its other properties.

A marked transformation has taken place in the two years since the work first was undertaken. Forty stations, representing every section of the territory through which the line runs, have been changed from their former drab and in some cases unsightly appearance, to a present condition of cleanliness and beauty, a fine example for railroads everywhere.



The Beautiful Grounds Surrounding Chesapeake & Ohio New Station at Ashland.

Flower Planting in Front of Chesapeake & Ohio Station at Huntington, Indiana.

A study of conditions has been made over the entire system, mapping out of plans and programs for future improvement. The grounds are first cleaned up, then follows the laying out of plots, digging, planting and finally the plants are seen to grow and blossom. The photographs in connection with this article show some of the results that have been obtained up to this time. At present, two forces of men spend their entire time on this work. Each force consists of seven gardeners in charge of an assistant supervisor of station grounds. The gardeners are all practical and experienced men, having been recruited largely from the country, and they are going ahead with enthusiasm in the planting and cultivating of flowers and shrubs. Each force is provided with regular camp car equipment in which the men live and travel, moving from point to point and doing the work provided for in the pre-arranged program.

In connection with the work, the Chesapeake & Ohio has established a nursery at North Caldwell, W. Va., from which it soon will be obtaining all its shrubs, evergreens and flowers. In this nursery, which was started about nine months ago, there are 16 acres of highly cultivated soil in charge of an experienced gardener.

In the planting for improvement of the grounds for each station, native plants and flowers are selected that are indigenous and characteristic. In this way each community is given the kind of flowers and shrubs to which it is accustomed, and the traveling public escapes a monotony that would be evident if all the stations were handled in the same way.

In laying out the character of gardening which is to be developed, consideration is given to the lay of the land, its relation to the station and to the abutting streets and property, trying to determine on a result that will be pleasing and in harmony with the surroundings.

While the most spectacular part of the work has been in beautifying the grounds around the stations, much time has also been spent in improving the sanitary and living conditions around the section foremen's houses, tool houses and other properties.

The work is most interesting and has the full sympathy and coopera-

A Corner of Station Grounds Made Beautiful With Flowers.

Keswick

tion of the people in practically every community. There have been many cordial expressions of appreciation for what has been accomplished. The work is done by the maintenance of way department under the direct supervision of C. A. Bahen, supervisor of station grounds.

Some form of work and improvement has been done during

Hewlett

the past year at the following stations:

Newport News Division.—Newport News.

Richmond Division.—Morrison, Oriental, Lee Hall, Lightfoot, Providence Forge, Scottsville, Atlee, Peake, Hanover, Hewlett, Beaver Dam, Bumpass, Frederick Hall, Pendleton, Mineral, Louisa, Trevilian, Green Springs, Cobham, Keswick, Shadwell, Williamsburg.

Atlee

Clifton Forge Division.—Longdale, Fisherville, Covington, Clifton Forge, Charlottesville, Swoope, Christian, North Mountain, Augusta Springs, Fordwick, Craigsville, Millboro, Griffith, Ronceverte, Alderson, Ivy and Goshen.

Greenbrier Division.—North Caldwell.

Hinton Division.—Hinton, Montgomery.

Huntington Division. — Huntington, Charleston, St. Albans, Hurricane, Scott, Ona, Barboursville, Milton, Catlettsburg, Ky.

Logan Division.—Logan, Chapmanville, Big Creek, Gill, West Hamlin.

Ashland Division.—Winchester, Ky.; Ashland, Ky.; Mt. Sterling, Ky.

Cincinnati Division.—Maysville, Ky.; Covington, Ky.; Newport, Ky.; Dover, Ky.

It is not hard to believe that the work of improving and beautifying the station grounds will have wide and beneficial effect in the various communities and that the good example set will be generally followed.

Transportation is enabled to present the story and photographs of the Chesapeake & Ohio's fine station work through the cooperation of that company's employes' magazine.

New Lines To Cost $2,000,000

Total cost of construction of the Oregon trunk extension from Bend to a connection with the Southern Pacific at Chemault and cost of terminal properties and lines within Klamath Falls, will approximate $2,000,000, according to Ralph Budd, president of the Great Northern Ry.

Accompanied by a group of Great Northern and Spokane, Portland & Seattle officials, Mr. Budd has been inspecting properties of the northern lines in an attempt to determine definitely the location and size of terminals in Klamath Falls.

Shadwell

Mr. Budd denied a rumored intention of the Great Northern to extend from Klamath Falls south into California to a connection with the Western Pacific.

The first Oregon Trunk train

Beaver Dam

will arrive in Klamath Falls early in 1928, if present plans do not miscarry, the rail official said.

The directors of the Order of Railway Conductors have selected Jacksonville, Fla., for the next triennial convention to be conducted in May, 1928.

Bulwer Lytton has summed it all up in the following lines: "What men want is not talent. It is purpose: in other words not the power to achieve but the will to labor. I believe that labor, judiciously applied, becomes genius."

Mineral

Editorial Comment

The Wonders of History

"I SERVED with General Washington in the legislature of Virginia before the Revolution," wrote Thomas Jefferson, "and during it, with Doctor Franklin in congress. I never heard either of them speak ten minutes at a time, nor to any but the main point which was to decide the question. They laid their shoulders to these great points, knowing the little ones would follow of themselves. If the present congress errs in too much talking, how can it be otherwise in a body to which the people send 150 lawyers whose trade it is to question everything, yield nothing, and talk by the hour? That 150 lawyers should do business together ought not to be expected."

Rates on Feeders Reduced

As a result of negotiations carried on with the railroads by the California Cattlemen's Association, stockmen in the San Joaquin and Imperial valleys and in the coast counties will be able to purchase feeders in Oregon and Nevada on far more favorable terms than heretofore. Reduced freight rates have just been made effective, and some of the reductions almost cut the former rates in half.

Reduced freight rates obtained for stockmen by the California Cattlemen's Association are saving them almost $1000 a day, according to John Curry, traffic manager.

The Human Element in Car Design

An article appearing elsewhere in this issue pertaining to the new drover and bunk cars designed by the Union Pacific, may appear to some as only another new car design. But not to the men who actually built them. Primarily they had in mind not only economic advantages and mechanical construction, but they had figured just what these cars would do from the human element standpoint in helping the traffic department of the road, in improving the morale of the employes who live in the bunk cars, and also the life and mental capacity of the man who runs the rules examiner car.

After making a study of these cars one can readily understand how providing for drovers a car as comfortable and convenient as the Union Pacific has just produced will naturally assist the traffic department in getting the business of the live stock shippers.

Before designing these cars a very thorough study was made of the requirements and service to which the cars would be put. The human element was thoroughly analyzed. The habits of the workers who will occupy the bunk cars were remembered and the arrangements so adjusted that these workmen may live in units of eight, which is their preferable method. In fact, every little detail in design has been developed primarily to meet the requirements of the men who are to use the cars. In addition, thought and care have been given to the element of safety, and this is distinctly worth while.

Rough Handling Still Exists

Despite the very fine work done by special forces in the freight claim prevention division, the loss and damage to carload freight does not seem to have decreased in the same proportion as it has for less-than-carload. Claims on perishable freight, especially fruits and vegetables, have not decreased as rapidly as other claims. Rough handling still seems to be one of the great problems of the railroads. No rules are likely to do much in overcoming this particular feature. Punishments are not likely to have the desired effect. The only way to eliminate rough handling is to gain the increased friendly interest of the employes who handle the freight. This means a process of education and it means time. The only way to reach these employes is by talking, not by printing.

Color in Safety First

The attention of safety first supervisors is respectfully directed to the interesting experiment of the Bamberger Electric Railroad Company at Salt Lake. This line has, its officers declare, decreased the number of accidents by changing the color of the cars. The body of the Bamberger cars is painted with what is called a pullman green with an attractive yellow for the uppers and the trimmings. An article describing the operations of this short line says a decrease in the number of accidents is due primarily to the fact that the new cars under their present color scheme are visible at a greater distance and that this feature has the tendency to minimize the number of mishaps at crossings along the right of way. There seems to be a great deal to think about in this experiment.

Big Plans For Chicago

Word comes from Chicago that a new railroad passenger station to cost more than 100 million dollars is being planned by the executives of the railroads in that city affected by the straightening of the Chicago River. Four sites have been selected

tentatively, all south of the loop. It will be a great pleasure to record something definite about this project which has been described and pictured and talked about and dreamed over for many years. But the railroads still have the Chicago city council to consider before they build this mammoth station.

The river straightening is progressing. Commissioner Wolfe of the bureau of public works says the new channel will be completed and water running through it within two years. When the river has been straightened, it will be possible to open three streets, at least, from the loop south, which means relief for the almost unbelievable congestion now existing in the business center of Chicago.

No Water in the Union Pacific

If the sins of the parents are visited upon the succeeding generation it is to be hoped young Senator LaFollette will survive the reading of the Union Pacific valuation report. How it would have irked the energetic father had he lived to see it.

Imagine, Senator, there is no watered stock in the Union Pacific capitalization! And your honorable dad said it and all the rest of them were waterlogged. Why, even the Erie ———.

The Interstate Commerce Commission announced its valuation of the Union Pacific not long ago. The figures were $242,064,968 on the road's property embraced in its 3,601 miles of road operated in western states. The date of valuation was June, 1919, but since then the road has made large improvements. In addition, the commission set a valuation of $372,807,048 on the road's holdings of securities in other corporations. This makes a total capitalization of nearly $615,000,000, but the Union Pacific's total capitalization on the valuation was nearly $687,000,000.

What Brand of Economics Is This?

Fruit growers' organizations are appealing to the Interstate Commerce Commission for lower railroad rates because the prices they get for their products are lower than they have been for a long time. This is in line with the demand of a western senator for rate reductions on wheat because prices were down.

Upon what reasoning basis, to dignify the affair, do these men expect to get results to suit them? With practically all crafts in railroad work demanding higher wages and getting them, with every kind of equipment, cars and locomotives, costing about twice as much, and more in many cases, than before the World War, how are railroads to be expected to cut their rates? Because fruit prices are low? Because a man in Arizona or southern Texas is growing something for which there is no demand in New York should the railroads be required or expected to carry that produce to the eastern seaboard at an out-of-pocket rate?

If growers will persist in shipping apples into an apple-growing center where there is no sale, should the rate be cut? What kind of reasoning is this? If the price of fruit and wheat goes up, will these growers consent to increased rates? When wheat soared to $3.50 a bushel, just before the government stepped in, in 1917, and stopped it, did anyone ask for higher rates on wheat? Isn't it a fact that at that very time the government declined to give the western roads an advance of 15 per cent in rates? Economics and freight rates and reasoning and logic seldom go together.

For 18 Months 360 Per Cent

One form of writ that chills the heart of the average wage earner, perhaps, is the garnishee. Obviously, the man who lives within his income does not borrow money or get into debt, but there are circumstances in which the best of men, earning money regularly, do have to borrow; and very often they wish to keep the fact from their friends and employers.

In Chicago, early in June, a jury discharged Richard Cottin, an employe of the Chicago & Western Indiana Ry., from the obligations that resulted from a $15 loan and wage assignment made in 1925. Cottin, the evidence showed, paid interest upon the $15 loan at the rate of 240 per cent a year for a year and a half, and found at the end of that time that he still owed $20.

The outcome was made possible by the action of the railroad company in resisting a garnishment proceeding against its employe. This permitted the legal aid officials to intervene in behalf of the loan victim and to get the facts before a jury in the form of testimony.

The jury held that the amount of Cottin's original loan had been paid, with unlawful interest, and that so far as the $20 note was concerned, Cottin had not received the sum named as consideration. It is believed the verdict will serve as a precedent for many pending cases, and probably will result in freeing thousands of careless or ignorant borrowers from the clutches of loan sharks.

Hot Weather Reflections

One is nearly always in the dark about the underlying influences animating men in business matters. Consider the intricacies of railroad ownership, and then think, if you can, just what is the meaning behind certain proposed consolidations. So long as good service is given the public, so long as the public is not imposed upon in any way, and there are laws enough, goodness knows, to prevent this, the public shouldn't worry.

These reflections grow out of the proposed consolidation of the Great Northern and the Northern Pacific, now before the Interstate Commerce Com-

mission. The possibilities in this consolidation and the power under the rug are immensely interesting. The completion of the Moffat tunnel adds to the interest. If the Denver & Rio Grande Western is permitted to use the tunnel, it would open the way for a short route from San Francisco to Chicago; to Salt Lake by the Western Pacific, from that city to Denver by the D. & R. G. W., and from Denver to Chicago by the Burlington. The Burlington is controlled jointly by the Great Northern and the Northern Pacific through stock ownership. The outstanding financial figure in Great Northern and Northern Pacific ownership is Arthur Curtis James of New York, who also figures very largely in the Western Pacific. Also Mr. James is a principal owner of the Southern Pacific. The Great Northern and the Northern Pacific jointly control the Oregon Trunk Ry. reaching as far south as Bend, Oregon. Heretofore it has been proposed to extend this road southward to Klamath Falls at a cost of about 7 million dollars, but now it is reported the Southern Pacific will permit the use of its tracks for the Oregon Trunk from the present Hill terminal at Bend to tap the Southern Pacific at Kirk. If this confusion of ownership and community of interests and financial maneuvering doesn't present a pretty picture, you are at liberty to say just what it is.

The men in control of all these western properties are wise operators. They are trying in every sensible way to cut out duplication of service, to reduce the cost of manufacturing transportation, and eventually, perhaps, to make it possible for the owners of these properties to receive a really fair return on the enormous investments they have made in the public interest.

When Peter Cooper Was Born

The startling developments in aerial transportation, emphasized by the individual achivements of three or four young men give rise to reflection. Lindbergh and Chamberlin and Byrd have had the fine opportunity to do something for humanity, such as few men ever have experienced.

Peter Cooper said in an address, in 1874, in New York that it happens to very few men to change the current of human progress as it happened to Watt, to Fulton, to Stephenson and Morse. But most men may be ready to welcome laborers to a new field of usefulness and to clear the road for their progress.

When Peter Cooper was born, New York had only 27,000 population. The upper limits of the city were at Chambers street. There was not one free school, day or night, in the city. Washington had just entered upon his first term as president. The expenses of the United States government were $2,500,000 a year, about 60 cents a head. Not one steam engine had been built on the American continent. And this is the man who made an important and interesting address in New York in 1874, when, of course, he was a very old man. But Cooper said he had kept young by always giving a friendly welcome to new ideas. He had tried never to become too old to learn. It was said of him that when he died there may have been many wrinkles on his face, but there was none on his heart. It was always young.

The Editorial of This Edition

All men, perhaps, give a good bit of thought at some time in their lives to three things, wealth, success, happiness. For some the first means all three, at least until the day of disillusionment. For others success means happiness whether it bring wealth or merely the satisfaction of accomplishment, for it must be remembered that many men count themselves successful who never have much money. These are, after all, the greatest philosophers because achievement, with no thought of material gain, means joy. Lindbergh's success has no thought for the millions he turned away. For him achievement meant happiness.

Edward Harriman used to say that if you expected success you would have to attend strictly to business, and keep just a little in advance of the times. The man who reaches the top, he said, is the man who is not content with doing just what is required of him. He does more. Every man should make up his mind, Mr. Harriman said, that if he expects to succeed he must give an honest return for the other man's dollar. "Grasp an idea, and work it out to a successful conclusion," said he. "That is about all there is in life for any of us."

Arthur T. Hadley says that now, as always, what is needed is men, the right men. "A well thought out plan without a man to execute it is a waste of money," said he. "But get a man with a plan, and the more money he has the greater is his chance of doing a large work. A plan without a man is as bad as a man without a plan—the more he has the more he wastes."

All of which sounds perfectly logical and common sense until we encounter some of the astounding facts of industry as disclosed in June in Walter Pitkin's "New Testament of Science," now appearing serially in the Century. In these enlightening papers Mr. Pitkin declares in effect we already have a superabundance of brain development in America, that ideas are running away with things, or would be certain to overwhelm industry if only a small part of them were permitted to develop their projects. In engineering, for example, there seems little doubt that brains are a veritable overload. Mr. Pitkin quotes a leading electrical engineer known all

over the world, as declaring the only problem is not what can we do in that science, but which thing is the most profitable to do next?

"No sooner do we spend several million dollars on a new invention," said another engineer at the head of an immense corporation, "than some young stranger saunters into our office and shows us a still more revolutionary device he has just doped out. Were we to adopt each new device purely on its own merits, we should soon wreck the business. Each new adoption would cause us to lose all the millions previously spent in other devices."

"Right now," said one of our greatest captains of industry a few months ago, "two of our largest manufacturing corporations are gravely perturbed. They have, in their own laboratories, perfected certain devices which I am not free to name even vaguely. These inventions, based on remarkable discoveries in physics and electrochemistry, are so radical and of such far-reaching importance that the companies owning them fear to undertake their commercial development. Business advisers assert that, were the devices placed at once on the open market, hundreds of millions of dollars, now invested in less efficient products, would be lost irrevocably. And the injury of such a colossal failure might, for a period of many years, exceed all the benefits accruing from the new devices."

The whole subject is vastly interesting to transportation in many ways. "It undoubtedly is a fact," said a great engineer, "that if some perfectly feasible developments in power were immediately adopted the entire business of steam transportation as we now know it, would have to be scrapped."

There are perfectly normal business men in this country today who are sincerely alarmed over the invention of rayon, artificial silk. Walter Pitkin points out that nearly half of Japan's population depends largely on natural silk in one way or another. The mulberry tree and the silk worm stand between millions of Japanese peasants and starvation. Let Europe and America build 50 more of these enormous rayon factories making a silk substitute and the silk business of Japan will be ruined.

What do we care? How does this touch railroads or steamships or other transportation? In many ways, including the cutting off of revenue from carrying silk across the sea and over the continent. Everything affecting business affects transportation also.

"Why do you go on preaching about success and the rewards of labor," a young college man said after reading the New Testament of Science. "What's the use? We're already ahead of time."

In the automotive industry the situation is similar to that in others.

"There are thousands of mechanically correct and commercially sound inventions in the automobile field," said a prominent automotive engineer at a recent scientific convention Mr. Pitkin reports, "which will go to the scrap-heap untried. Carbureters better than any now in use. Timing-gears superior to standard makes. Preheating devices, gear-shifts, differentials, and what not. Manufacturers must refuse them, sometimes because they involve a redesigning of entire engines which would eat up millions of dollars for new factory equipment, and sometimes because the inventions would involve changes in the fuel or oil or standard parts now supplied to the automobile trade by other companies."

But even in the face of all this the situation is far from hopeless. Brains always will be in demand, and there never will be any keen competition between skilled labor and ignorance. The man who spends his time inventing something that isn't needed is riding for a fall. Farmers who ship apples into the Hood River Valley country never find good prices. Now, as always, to return to Mr. Hadley, the need is for good men with plans and the ability to execute them.

As to Automatic Connectors.

The American Railway Association has recently appointed a joint committee of the operating and mechanical divisions to develop data relative to automatic hose connectors for locomotives and freight and passenger cars. The association has also sent out circular No. 2673 asking its members to submit a complete historical record of every development, records and results of tests, and so forth made by them, of automatic connectors.

Since this invitation for historical record has been requested we are inclined to contribute a little story in this connection which developed on one of the railroads some years ago. One of the mechanical men had been asked to supply a similar report. After giving all the usual detail and data pertaining to experiments and tests made with the automatic connector by his road the mechanical gentleman concluded with the statement that in spite of the foregoing he felt that the automatic connector had real merit, and that the main reason it had not been more widely adopted and tested was due to the attitude of the railroads in demanding a fully perfected device before they were even willing to give it consideration. He further questioned just what the status of the automatic coupler, the air brake and the simpler appliances would have been today had the railroads demanded, in their inception, a fully perfected mechanism.

We are reminded too, of a report made by a committee appointed to investigate this subject some years ago before the annual convention of the mechanical division. This committee's report was indeed simple. It suggested a continuation of the

committee and stated that sufficient applications and tests of automatic connectors had never been made to warrant the committee at that date even submitting a report on the subject. A few isolated tests were then cited but the report overlooked entirely large installations and tests made of the device in question. The report indicated absolutely nothing but a lack of interest on the part of the committee. If its members had made any investigation of the subject the connector was even then far enough advanced to warrant very interesting data. If the use of automatic connectors is warranted, as the appointment of this committee by the A. R. A. indicates then the cooperation of the mechanical officials of the railroads should be given the manufacturers of these devices to assist further in their development.

Fewer Essentials, More Luxuries

A great deal still is said about the high cost of living. Reports from the department of commerce show that 46 per cent of all manufactured goods in America in 1900 were essential goods such as food, textiles and materials for shelter. Now this proportion has shrunk to 32 per cent. We are going at still higher speed, living on an increasingly higher standard. Human demands are more excessive. We are not yet out of the silk underwear period, and perhaps we never shall be. In short the figures show that American people are spending more and more for things they have come to believe necessary. Two small town carpenters in California buy an airplane to carry them to their work. Four policemen in Gary, Ind., also, have bought a plane ostensibly to chase bandits. It's a poor kind of workman, nowdays, who rides the street cars to and from his job. Most of them own, or at least drive, automobiles. It is, indeed, a fast age in which we live.

The Value of A Second

Great results often come from very little beginnings. It requires 200 horsepower of electrical energy to stop and start an average street car whereas it requires only 50 horsepower to keep it in motion.

The importance of little things was emphasized by C. D. Stewart of the Westinghouse Air Brake Co. last month in his interesting article on "The Reasons for Variable Load Brakes, published in this magazine. Mr. Stewart drew attention to the relative value of seconds. When an operation is seldom repeated, he said, a second is of small consequence, but when the operation is repeated at close intervals, these seconds become extremely important. Mr. Stewart told the story of J. K. Brice, traffic manager of the London County Council tramways, who said that a saving of one second at every stop would represent to his system a total every day of 220 hours which would permit 2,000 additional car miles to be run daily without increase in the number of operations or number of cars. He said a saving of 17 cars at $9,600 a year each would mean a reduction in operation cost of $163,000 a year, and this would be possible by saving a second at every stop on his system.

The Restless 40 Millions

The human mind cannot understand anything much about four billion dollars. Doubtless it is a lot of money. According to the sharps who round up such figures, about that much was spent or will be spent in 100 days this year by Americans in foreign travel and motor touring at home.

One of the popular data hounds, Frank E. Brimmer, said a few days ago in System that the market of nomadic Americans is worth three billion 300 million dollars.

The department of commerce estimates tourist expenditures abroad, last year, at nearly 700 million dollars, a gain of about 330 million since 1922. And this vast increase came after the passage of the immigration restriction laws.

Americans spent nearly 200 million dollars in Canada in 1926, and little of it was for books or magazines. In 1925 when the great pilgrimage to Florida was in full swing, more than two million automobiles carrying, it is said, five million persons, entered Canada. What attracted them to that country?

Mr. Brimmer says that two-thirds of the 40 million Americans who travel about in 10 million automobiles at some time or other during the year stayed at hotels and spent about two billion 200 million dollars in a year for everything. About one-third of the motor tourists camp under canvas and spend one billion 100 million dollars. The average camp outfit costs $200, and as one-third of those found in tourists camps every year are "first timers," Mr. Brimmer thinks the yearly purchases of new camp equipment run to about 250 million dollars. All this is great for business, hard on railroads and fine in its production of strong and healthy, and for most of the time, happy human beings.

The Longest System

If the Northern Pacific and Great Northern merger is approved by the Interstate Commerce Commission, it will make one of the longest railroad systems in the world, about 27,000 miles. The Canadian National Railways are a little longer than this perhaps, but they comprise quite a number of properties. The proposed system extends from Chicago and Duluth to Seattle and Portland, and south to Fort Worth, Dallas and Houston. Under the proposed plan the two northern companies and the Spokane, Portland & Seattle Ry. will be controlled by lease by the holding corporation. The

Burlington and its subsidiaries, although controlled by stock ownership by the northern companies, is not to be included in the actual merger. As described in this magazine in May, the joining of these properties was proposed by James J. Hill more than 25 years ago, and has been talked about ever since.

Safety In the Air

Special efforts are being made to educate the public into a more confident feeling toward aerial travel. Air journeys in Europe are commonplace. Over here the average man still is fearful about getting into a plane.

This is a peculiar attitude, too, when we think of the carelessness with which most folk enter an automobile or a railroad train. In the first six months of this year, 460 persons were killed in Chicago by automobiles. Fatalities from motor accidents are proceeding at the rate of 31,000 a year in the United States. In a single month, recently, there were 82 such fatalities in Los Angeles alone. But nobody hesitates to ride in an automobile. Considering the mileage flown, the number of passengers carried, even in the United States, aerial transportation already is making a good record. There aren't many collisions. There are no orders to forget. No block signals to be ignored. The right of way is wide and high and handsome.

One More Puzzle to Solve

Airplanes, contributing amazingly, these days, in the development of transportation, also are adding to the complications of every day existence. Among the "Queer Things that Happened in July," was the arrest of an aviator by a flying deputy sheriff for being up in the air while intoxicated. Another flew so low he decapitated a pedestrian. It has become sufficiently terrifying to try to get through the city streets dodging automobiles, many of them driven by morons and some by persons intoxicated in one degree or another. The airplane with a drunken pilot adds one more risk. Chicago's plan to build elevated sidewalks won't solve the puzzle. Underground subways for pedestrians only might help some.

Holden's Four System Plan

Hale Holden, president of the Burlington, has another consolidation plan. Like the first "four-system" plan proposed by President Holden some years ago, the present suggestions are important and extremely interesting. Almost anything is interesting when it has common sense behind it in the scheme to consolidate railroads. Most of the plans have no sense and most of the consolidations proposed in the past were funny, if one has a proper sense of humor.

Mr. Holden's recent plan reaches the public because of the application of the Great Northern for permission to consolidate that road with the Northern Pacific. Mr. Holden shows that each of the four groups in his plan would represent a system of from 30,000 to 35,000 miles with a property investment of about two billion dollars, and each would have access to the Great Lakes, the Gulf of Mexico and the Pacific Coast.

Group 1 would be composed of Burlington, Great Northern, Northern Pacific, Spokane, Portland & Seattle, Colorado & Southern, Fort Worth & Denver City, Wichita Valley, and Trinity & Brazos Valley, all of them at the present time being associated lines. To them would be added the Chicago Great Western, Kansas City Southern, Louisiana Railway & Navigation Co., and two other small roads.

Group 2 would include the Santa Fe, North Western, Iron Range, Soo Line, Chicago & Eastern Illinois, St. Louis Southwestern, and Western Pacific.

Group 3 would include the Southern Pacific, Central Pacific, Rock Island, El Paso & Southwestern, Missouri Pacific, Katy, and (to bridge the gap between Colorado and Utah) a half interest in the Denver & Rio Grande and the Denver & Salt Lake City.

Group 4 would center around the powerful Union Pacific system, and include the C. M. & St. P., Chicago & Alton, Minneapolis & St. Louis, St. Louis-San Francisco, Wabash lines west of the Missippi River, International & Great Northern.

Mr. Bush Is Foolish

Any business man of importance who says publicly that promotion, success, getting ahead in the world, is a matter of influence, of pull rather than push, is talking foolishly and ought to be ashamed of himself. Matt Bush of New York, president of the American International Corporation, said these things the other day in San Francisco.

Said Mr. Bush: "All these stories of poor but honest farm lads who worked themselves from oiler to president of the road, are mostly 'bunk.' "

It isn't true. Mr. Bush knows it isn't. If he knows the industrial history of this country he must know the interview he gave out in San Francisco was the worst kind of flapdoodle—worst because it is dangerous and discouraging.

A Few Large Thoughts

President Coolidge said, not long ago, this country has paid out, since 1917, more than eight billion dollars in interest alone—eight billions! Still, state governments go right on selling bonds for public improvements because they haven't the ready money, and none will be available to pay the bills unless more and more bonds are sold.

What's the News in Washington?

Car Requirements Noted

By W. E. Hopkins

A MODERATE stimulation in business of the country for the third quarter of 1927, compared with the corresponding period last year, is indicated by reports just received by the car service division of the American Railway Association from the 13 shippers regional advisory boards throughout the country.

These reports which pertain to 27 of the principal commodities, are based on studies made by the various commodity committees of the regional boards and give one of the best indices to business available for the reason that the estimates as to transportation requirements for the various principal industries are made by men closely in touch with those industries.

Tabulation of these reports indicates that the 27 commodities will require 9,992,580 freight cars in July, August and September compared with 9,576,383 cars for the same period last year, or an increase of 416,197 cars in excess of last year, an increase of 4.3 per cent.

This is the first time that the car service division has attempted to tabulate freight car requirement reports for all the boards in an effort to determine the business outlook for any quarter. From now on, it is the plan to make public these reports four times a year.

Of the 13 boards, according to the reports just tabulated, only two, the Southwestern and the Pacific northwest boards, estimated a decrease in business, increased transportation requirements compared with the same period in 1926 being estimated by all other boards, ranging from three-tenths of one per cent in both the New England and the northwestern regions to 11.7 per cent in the central western. The territory covered by each board corresponds roughly with the territory of each federal reserve bank.

The Pacific Coast board estimated freight car requirements for the 27 commodities for the third quarter at 457,255 cars compared with 448,139 cars in the same period last year or an increase of two per cent.

For paper, printed matter and books, the Pacific Coast board estimated 5,139 cars would be required in the third quarter in 1927 compared with 2,438 in 1926, while for cotton 525 cars will be needed, an increase of about 20 per cent over one year ago. Car requirements for citrus fruit, it was estimated, will be 17,540 cars compared with 14,884 for the third quarter last year, an increase of nearly 18 per cent, while petroleum and petroleum products will need approximately 54,412 cars, an increase of almost 15 per cent compared with the same months in 1926.

Despite the optimistic reports of the various shippers regional boards, actual loading of revenue freight for the first three weeks in July showed a decrease of 162,000 cars under the corresponding period last year, and an increase of only 11,400 cars over 1925. As a result, the total loading for the first 29 weeks this year has amounted to 28,204,078 cars, an increase of 155,358 over the same period in 1926, and 1,009,642 over 1925. Up to approximately June 1 loading of revenue freight from the first of the year was substantially greater than last year, the total for the first five months in 1927 having been approximately 432,000 cars above the year before.

California ranks fourth in production of watermelons, the bureau of railway economics has announced in a study just made public dealing with production and distribution of that commodity. The greatest watermelon state is Georgia which ships more than 31 per cent of the total for the country, while Florida comes next with nearly 17 per cent, Texas third with 11 per cent and California fourth with 10.4 per cent.

The Interstate Commerce Commission devoted July to the task of cleaning up its docket so far as possible in order to permit as many members of the commission as could get away to acquire needed rests in anticipation of a busy winter.

One decision of interest rendered by the commission late in July was that denying an application filed by the Delaware Lackawanna & Western and subsidiary companies, as part of a plan for the distribution of part of the Lackawanna's surplus assets for a modi-

fication of previous orders of the commission which had authorized an issue of bonds by the subsidiary companies, the New York, Lackawanna & Western, and the Morris & Essex R.R. The commission held the disposition of bonds by the Lackawanna as proposed would materially increase its interest burden without apparent necessity, and the commission is unable to find that the assumption of liability by the parent company in respect of the bonds of the lessor companies to be compatible with the public interest.

The commission, in another decision, held that freight rates on anthracite in carloads from the anthracite region of Pennsylvania to specified destinations within the metropolitan Boston district but outside the Boston switching district are not unreasonable but are unduly prejudicial. The decision was rendered in proceedings brought by the Chadwick Coal Yard Co., against the New York New Haven & Hartford R.R. The rates were found by the commission to be unduly prejudicial to complainants, retail coal dealers outside Boston switching district, to the extent that they exceeded and exceed contemporaneous rates to adjacent points in metropolitan Boston outside of the Boston switching district and not on tidewater, where the distances are no greater than to complainants' plants.

The Baltimore & Ohio R.R. has been authorized by the Interstate Commerce Commission to issue $63,242,500 of additional common stock, to be sold to present stockholders at $107.50 a share. The authorization is made on condition that no part of the proceeds of the stock in excess of $61,799,434 of capitalizable expenditures shall be expended until the applicant has submitted for the approval of the commission a statement of the purposes, and has filed reports and data in connection with the statement.

"While the necessity for underwriting in this case," said the commission's opinion, "may be subject to question, we feel that on the facts shown we should accept the judgment of the applicant's management as to that."

Lloyd Church of New York, a minority stockholder, opposed the road's application because of the proposal to pay to bankers an underwriting commission of $2.25 a share.

The commission has re-opened for further hearing proceedings relating to orders issued by it last November in which the railroads and telephone companies were ordered to establish a system of depreciation accounting in accordance with methods prescribed in the orders. The case is set for further hearing on Nov. 9 before Commissioner Eastman and Examiner Bunten in Washington.

Seek Increase For Handling Mails

Hearings began July 13 at Atlantic City, N. J., before an examiner of the Interstate Commerce Commission, on the request of the Class I railroads for a 40 per cent increase in the rate for carrying United States mails. The request has been submitted to the commission by representatives of 148 lines.

W. A. Worthington, vice president of the Southern Pacific Co., and chairman of the committee on railway mail, is handling the case for the railroads. The weight of mail matter has increased 75 per cent since 1917 on the space basis of carrying mail, Mr. Worthington pointed out, while all railroad rates except those on mail have advanced since that time.

The roads maintained that the increased cost of operation since the return to private control in 1918, has resulted in an annual deficit of possibly $37,000,000.

At the same time, officials of the United States post office department submitted evidence to refute the railroads' claims. Joseph Stewart, special assistant to the attorney general in the post office department, contended that the railroads are receiving the highest rate to which they are entitled, and that a cost study showed the railroads to be in better condition than in 1917, as far as the mails are concerned.

It is understood that no decision will be rendered by the commission before its next meeting in October.

Railroads and the Average Man

The railways performed a service for the average American citizen in 1926, equivalent to hauling for him 3791 tons of freight one mile, in addition to transporting him an average distance of 303 miles.

The Railroads of Class I in 1926 originated a total of 1,335,693,000 tons of revenue freight. Of this tonnage, products of mines represented 757,252,000 tons. The next largest group of commodities was made up of manufactured goods (296,067,000 tons), while the third largest group was agricultural products, including live stock. If the collateral tonnage represented by flour mill and packing house products be added, the total tonnage of agricultural and related products was 138,028,000 tons.—Bureau of Ry. Economics.

Here's Another Finnegan

In reporting a washout on the Canadian Pacific, the section foreman wired a complete report to the superintendent, gave all details as to mile posts, bridges, track distances, etc., says an exchange from the North, to which the superintendent wired back instructions to make the wire report shorter in the future, and follow the message up with the details in a letter.

Several weeks later another washout occurred, the section foreman wiring:

"Where the track was the river is."

Little Stories About Big Men

THE eternal problem. "You are printing some good things about successful men," writes a young man who was graduated in June from the University of Illinois. "Doubtless you intend these stories to be encouraging, but I don't just see the point. There may be a weak spot in my make-up. I confess it gets by me. Most of these men you tell about—you and some other magazine editors—always talk about work, hard work, poor pay, or no pay at all; quit school in the seventh or eighth grade; very few ever got to high school or college; slept in the barn or the attic; owned one pair of overalls up to the time they were 18. Twelve or 14-hour days for them. Now they're presidents or chairmen of boards. That reads pretty good, and I don't doubt it's all true. But—

"I had no hard knocks. My way through college was paid for me. I took a civil engineering course. Graduated a few weeks ago. When I presented my diploma to one of the railroads the man offered me a job inspecting cars—tapping car wheels to see whether they're cracked. I felt like tapping him. Is this where my college work gets me?"

It is to be hoped this Resentful Graduate will not boil over when he reads this story. It may make him sore. Indeed it is a dreadfully discouraging yarn for any chap who fancies he can step from college into a swivel chair at a lovely mahogany desk. But it certainly does carry a world of conviction.

This is the authentic record of a young man graduated, in 1886, from the mechanical engineering school of Yale University. Realizing, strange as it may seem, that

General Atterbury Isn't Nearly So Grave As This Portrait Indicates. Now Look At Page 45.

this great school had merely taught him how to use his brains in an orderly way, and that a number of things would still have to be learned, this youngster found a job in the Pennsylvania Railroad's shops at Altoona as an apprentice. In this position his pay was five cents an hour for the first year, seven cents the second year, nine cents the third, and 14 cents the fourth year. His father having died, he determined to prove no burden to his family. Instead of working the regular ten hours a day, he worked 13 or 14 hours whenever permitted. Also, he joined the night policeman at the station in hiring a room, the policeman occupying the bed through the day and the apprentice using it at night. By the middle of his second year, although his pay was only seven cents an hour, he was able to meet all his pared-to-the-bone expenses.

This apprentice, with a degree from Yale in his possession, might have been excused if he had considered himself entitled to a certain amount of preferential treatment. He had back of him a long and honorable family history. He might have had much help from his family connections had he desired it, but he preferred to make his own way. It required grit to do the work this young man undertook when he went into the Altoona shops, but he had this quality, as many in high places have since discovered, and with it he had the determination to learn all the steps as he went along toward the top. From this apprenticeship at five cents an hour, sharing his bed with a policeman the young man from Yale went up to his present position, and as he went this is the record he made.

And, by the way, his name is Atterbury—William Wallace Atterbury. You may have heard it.

Entered Altoona shops in October, 1886, as an apprentice. In 1889—here you see the effects of educational preparation — became assistant road foreman of engines on various divisions. In 1892 promoted to assistant engineer of motive power, northwest systems of the Pennsylvania; in 1893 master mechanic at Ft. Wayne, Ind. October 26, 1896, superintendent of motive power, lines east of Pittsburgh and Erie. October 1, 1901—October seems to have been his lucky month—advanced to general superintendent of motive power. Two years later became general manager of lines east of Pittsburgh and Erie. Six years after this was made fifth vice president in charge of transportation. In 1911 became fourth vice president and was elected a director. In May, 1912, when the practice of designating the vice presidents numerically was discontinued, this title was changed to vice president in charge of operation. He was elected vice president in Novem-

ber, 1924 and in 1925—in October, of course,—he became president of the company.

If you, Mr. Resentful Graduate, have read this record carefully you must have noticed that Mr. Atterbury was advanced every year or two from the day he started in the Altoona shops until he became general manager, and the next jump was into a vice presidency.

Turn back, now, to the first job at five cents an hour. Can't you see the value in the preparation young Atterbury had made for the big things that followed? In the Altoona shops there must have been many persons earning very much more than he, but because of this preparation he passed them by. That's the common experience. Surely you get the right viewpoint now.

What kind of man is W. W. Atterbury and why is he called General? It's a great tale.

Shortly after the United States entered the war against Germany, Mr. Atterbury was requested by the secretary of war to go to France and assume charge, as director general of transportation of the American expeditionary forces, of the details of organization for the construction and operation of the United States transportation requirements in France, as well as their harmonizing with those of our allies in France. He sailed for Europe in August, 1917, and on October 5, that year, he was commissioned brigadier general of the United States army, which, three days later, was confirmed by the United States senate. He returned to America in May, 1919, and the following day received his discharge from the army. By reason of his work with the American expeditionary forces, General Atterbury received the following decorations:—

United States, Distinguished Service Medal.

France, Legion of Honor, rank of Commander.

Great Britain, Companion of the Most Honorable Order of the Bath.

Belgium, Commander of the Order of the Crown.

Serbia, Royal Order of the White Eagle.

Lewiston Narrows, Allegheny Mountains, Main Line of Pennsylvania Railroad.

Writing in the American Magazine in 1920, B. C. Forbes said, "Atterbury is no milksop, pussyfooter, no kowtower. A giant in stature, he keeps his body as rigorously in trim as when he worked in the shops as a mechanic. He is only fifty-four—he was made general manager of the world's greatest road at 37."

Seven years after Atterbury finished his apprenticeship in the Altoona shops he was sent back there. But this time he went in as superintendent. He was then 30 years old. In 1902, a boom year, Pittsburgh was hopelessly clogged. It seemed impossible to move the traffic. The master mind of the Pennsylvania system at that time was the late A. J. Cassatt, one of the ablest railroad giants America has ever produced. Mr. Cassatt realized that something drastic must be done. So he started out to investigate. One after another he questioned the road's officials. Everyone passed the buck to someone else. Mr. Cassatt discovered the only man who seemed to know what was wrong and how to right it was the young Altoona superintendent. He had stood the test. Within a week, Mr. Cassatt startled the railroad world by taking a man out of the engineering shops and making him general manager. To advance this young engineer over the heads of all the general superintendents and other operating experts caused widespread comment. No man of that age, he was then 37, or of purely mechanical experience, had ever been installed in this tremendously important position. Cassatt, however, knew what he was doing. Atterbury quickly justified his selection by straightening everything out and having traffic moving smoothly and swiftly. Here is the modest way Mr. Atterbury himself explains how the greatest traffic deadlock on the country's largest railroad was removed:

"My job was to go out and find what was the matter. I visited the different points where the congestion was worst, and tried to get a thorough grasp of the situation. Then all I had to do was to get the local fellows to remedy it. I

simply gave them the authority to do certain things necessary to relieve the jam. Generally the local men knew the causes of the trouble, but hadn't the authority to take the necessary measures. I just gave them the authority and they went ahead and did the job. The introduction of more powerful locomotives and larger cars helped to get things moving again satisfactorily."

Under General Atterbury's direction a unique system of transportation was created in France with lightning rapidity; a modern ten-berth dock was erected near Bordeaux out of the mud bank of the Garonne River; ships were handled so rapidly that a third of a million troops were landed in one month; the "Leviathan" was unloaded (including 11,000 troops), coaled, reloaded and dispatched in 84 hours, as compared with 82 days on her first trip and 34 days on her second trip to Europe; thousands of powerful locomotives and 30-ton freight cars were shipped to France in pieces and put together in the twinkling of an eye (139 cars were erected in one day); acres of warehouses were run up overnight; yards, terminals, spurs, switches, sidings, coal pockets, etc., were made to spring into being—all this and more was accomplished by American transportation experts, a proud page in the history of America's part in the World War.

Speaking about "The Rights of Those Who Labor," General Atterbury once said,

"The World War brought home to me that what we fought for in '76, in 1812, in '61, in '98, and again in 1917-18, was real—that life, liberty and the pursuit of happiness were the inherent right of all. I had always known that it was my right, but I do not know that I had ever had so keen a realization that it was the right of every other fellow. I tried to put myself in the other fellow's place. What did that right mean to me, and what did it mean to him?

Here We Have the Real President Atterbury in An Informal Portrait Snapped At A Ball Game.

"It seemed to me that the following at least were essentials:

"1. Steady employment;

"2. A good wage;

"3. Time for recreation;

"4. Opportunity to elevate myself in my employment;

"5. A voice in determining the rules and regulations under which I should work;

"6. A fair division of any profits after a reasonable wage had been earned and a sufficient amount had been paid to capital to attract it to an expanding business.

"I hate the word 'Labor' as ordinarily used, as it represents class distinction, for which there is no place in our American life. We all labor—some with our hands—some with our heads. Therefore when I say 'labor,' I mean 'all who labor.'

"Heretofore it has been considered a commodity, subject to the law of supply and demand; but from now on we must so set our house in order that all may have steady employment. A difficult job, I grant you, but one not impossible of solution by collaboration between producers, consumers and transporters."

Automobile competition doesn't worry General Atterbury. "I be-

lieve," said he, "the railroads will eventually work out a scheme of co-ordination of rail and motor truck service. On the Pennsylvania System we have already put into service a number of motor truck lines, which in large part take the place of the local freight train. We are also devoting a great deal of study to the question of using motor trucks at terminals to relieve congestion. The railroads realize the motor truck offers a field for study and development which will be in the interest of both the public and the railroads.

"Of course, the automobile in some parts of the country has been a serious competitor of the railways, and in some instances has forced the abandonment of passenger service. My own view is that a good deal of general good can be accomplished through co-operation on the part of all those concerned in the problem."

Sherman Rogers, a very widely known labor leader, said of General Atterbury, in 1924, "He is a railroader—a railroader who has climbed every rung of the ladder, not by pull but through hard work and broad experience. Therefore, he is intensely interested in every phase of railroad operation. But his hobby is men. He believes in men—and he likes men. Bringing about the total elimination of destructive deadlocks between employe and management is the controlling desire in the mind of the Pennsylvania Railroad president right now. It will be ten years before the general reaches the age where he steps down from the management of the Pennsylvania. In my own mind I know that his greatest desire is that during these years he will be able, to the best of his ability, to help bring about an understanding between workmen and management not only on the Pennsylvania Railroad but everywhere in the United States, whereby the strike will become ancient history and resort to interruption of service unnecessary."

The Cost of State Government

That mythical individual, the "average citizen," paid $14.29 to his state government in settlement of taxes in 1926. This, be it remembered, was only for state taxes, and included no taxes levied by the national government or by counties or municipalities. Incidentally, it represented an increase of $9.15 per capita, or about 178 per cent since 1917, when it was $5.14 per capita, according to figures taken from a recent report of the bureau of the census, which cast some interesting side lights on the growth of the cost of state government.

Swiss Guides Scaling Mountain Sides, Columbia Ice Fields, Jasper National Park, Alberta. Canadian National Railways.

Power Concentration the Demand

Test of the 60,000th Baldwin

By Lawford H. Fry

Metallurgical Engr. Standard Steel Works Co.

ONE of the outstanding demands of present day railroading is for greater power per unit of locomotive weight. A study of the development of the steam locomotive will show that growth in size which at first was rapid is now slowing down, that the earlier demand for greater power has developed into a demand for greater concentration of power, and that considerable advance in power concentration has been made in recent years.

The Baldwin 60,000, Three-Cylinder Compound, 4-10-2 Type Developed One Horsepower Per 100 Pounds of Locomotive Weight.

In the years from 1904 to 1924 the horsepower obtainable per 100 lb. of locomotive weight has increased approximately 65 per cent. Representative figures for freight locomotives show that in 1904 the locomotive weight required to develop one horsepower was 175 lb. This was reduced to 110 lb. by 1924, while in 1926 Baldwin locomotive 60,000 developed over 4500 horsepower with a weight of 457,000 lb., or one horsepower per 100 lb. of locomotive weight.

The complete story of the advance made in power concentration in the last twenty years would include many devices and appliances. Superheaters and feedwater heaters play their part, but one of the major factors is increase in boiler pressure. Twenty years ago a boiler pressure of 180 to 200 lb. per sq. in. was high. Then pressure of 200 to 210 became standard. In the last five years a large number of locomotives have been built for pressure of 240 and 250 lb. per sq. in. This pressure of 250 lb. per sq. in. probably is about the maximum that can be used with the conventional type of boiler having flat firebox walls braced with staybolts. In the last few years, however, several experimental locomotives with special boilers have been built for pressures 350 and 450 lb. sq. in., and at least one European locomotive is working with a pressure of 880 lb. per sq. in. Locomotive 60,000 has a working boiler pressure of 350 lb. per sq. in.

In order to use steam successfully at this pressure, two things are essential:

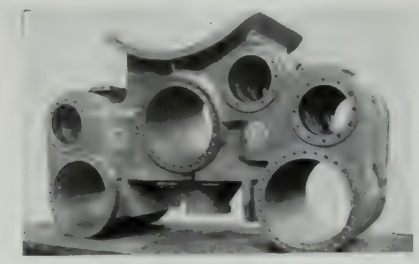
An adequate boiler construction.

Cylinders arranged to give a high ratio of expansion.

The necessity for the first is self-evident, while the second follows from the fact that with long cut-off and high boiler pressure the exhaust pressure will be high, and the steam will carry away energy which should be used in the cylinders. It is for this reason that locomotive 60,000 has been designed with compound cylinders.

Locomotive 60,000 is of the 4-10-2 type, built for freight service with drivers 63½ in. in diameter. The three cylinders are all 27 by 32″. The total weight in working order is 457,000 lb. of which 338,000 is on driving wheels. Apart from the modifications required by the water tube firebox and high pressure, the boiler does not differ from the usual type.

The barrel which is of the conventional firetube type with 206-2¼″ tubes and a type A superheater carried in 50-5½″ flues, consists of three courses having plates respectively 1 5-16″, 1 3-8″ and 1½″ thick. The third course is sloped on top from a diameter of 84″ at the front end to 94″ at the back. None of the studs tapped into the boiler pass all the way through the sheets, hence there can be no leaky studs. The firebox is of the water tube type designed to eliminate all staybolts. The hollow cast steel mudring is connected at each front corner to the boiler barrel by two 9″ pipes, while on each side 48-4″ tubes connect the mudring to the two horizontal drums. In addition to the 48 tubes on each side there are four 3-in. connecting the back section of the mudring to the two upper drums and five 3-in., which support the fire brick arch, running from the transverse section of the mudring to the upper drums. The 4-in. tubes are swedged to a diameter of 3-in. and the 3-in. tubes to 2-in. at the mudring end, where they are roll-

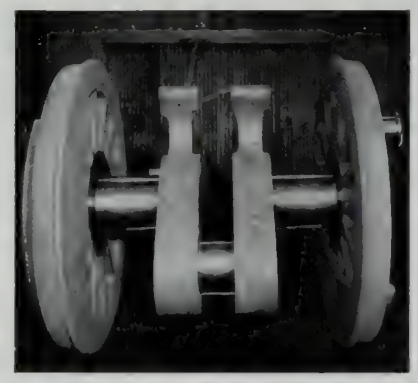


Cylinders. Rear View of One-Piece Cylinder Casting Finished and Drilled, With the Truck Center Pin in Place.

ed and belled, while at the drum end they are rolled, belled and welded.

The depth of the firebox from the top of the mudring to the center line of the drums is 6 ft 6-in. The total firebox volume, including the combustion chamber is 683 cubic ft. The grate area is 82.5 sq. ft. and the firebox volume 8.3 cu. ft. per sq. ft. of grate area. The portion of the firebox ahead of the arch forms a combustion chamber. Outside of the side tubes a firebrick shell is built, over which are applied removable plates covered with magnesia sectional lagging and sheet steel jacket. The front and back walls of the firebox are of firebrick and the opening between the two top drums is also closed with firebrick. The hollow cast steel mudring is 18 ft. 2 in. long by 8 ft. 5 in. wide. The rectangular outer frame is crossed by a central longitudinal member and a transverse member about six feet back of the front end of the firebox. The transverse marks the dividing line between grate and combustion chamber.

The upper drums are each 26″ in diameter, and the distance between centers is 31″. They have a total length of 23 ft. 6 in. and extend into the boiler barrel a distance of 5 ft. 6 in. The front ends come in contact with the top of the boiler barrel and are riveted to it. This provides a support for the front end of the drums, and helps to carry the long overhang of the firebox. Further, to balance the effect of the pressure on the back ends of the drums, three longitudinal stay rods are run from the forward end of each drum to the front tube sheet, and are anchored to internal braces riveted to the drum. This construction, with a system of braces connecting the front end of the mudring and the boiler barrel, relieves the back tube sheet of any tendency to distortion from the firebox overhang and the pressure on the drum heads. Each drum is closed at the rear by a cover plate secured to an internal ring by means of studs, and fitted with a copper gasket to keep the joint tight. By



Crank Axle and Wheels Assembled. The Second Pair of Driving Wheels, the Outside Cylinders Being Connected to the Third Pair. The Axle is Built up of Five Pieces

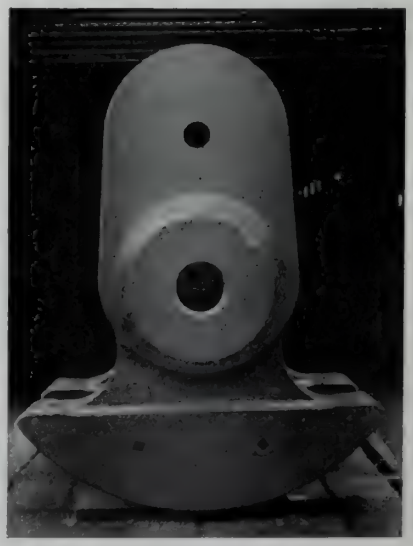
removing these covers the drums can be entered for the inspection, and cleaning of the water tube.

The three cylinders with their steam passages and steam chests are formed in a single gray iron casting. The high pressure steam chest is placed in the saddle on the right hand side, and is connected with the superheater by a single steam pipe.

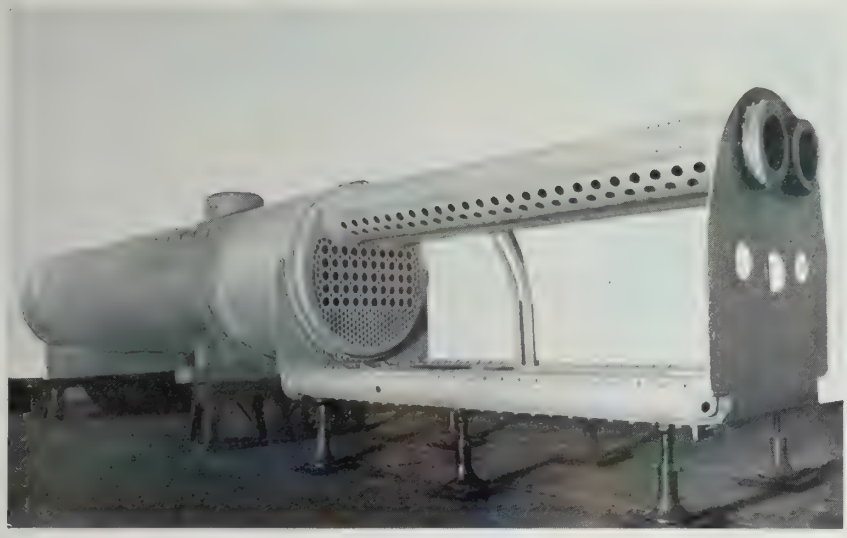
Steam is taken from the dome on the second barrel course, through an internal dry-pipe to the superheater header, the throttle being in the smokebox between superheater header and cylinders with shut-off valve on the dry pipe in the dome.

Live steam can be admitted to the low pressure cylinders through a 1 ½″ pipe leading from a manually controlled starting valve in the cab. Under all ordinary conditions of operation the locomotive when started works compound with this valve closed. The cranks on the third pair of coupled wheels which are driven by the two outside low pressure cylinders are set at 90 degrees so that the exhaust has four regular beats per revolution and also the wheels can be quartered on the usual quartering lathe. The inside high pressure cylinder drives the second pair of coupled wheels through a crank axle. The crank cheeks are of cast steel with counterbalance pockets filled with lead. The inside main rod has a marine type back end with the cap forged in one U-shaped piece integral with the bolts.

Walschaerts valve gear is used, with an independent motion for each cylinder, but all controlled by one power reverse gear. All three links and the single reverse shaft are carried by a cast steel motion bearer crosstie. The link at the extreme right actuates the valve for the middle cylinder and is driven, through the transverse shaft, by the left hand crosshead. The left hand link operating the left valve is driven from the left main pin. The lead for each link is obtained from the crosshead of the corresponding cylinder. To recapitulate, each valve receives its lead from the corresponding crosshead, while the left hand is driven from the left hand main pin, the inside link from the right hand



End View of Completed Crank Axle. Crank Cheeks are Cast Steel, Each Made in One Piece with Counter-Balance Weight Cored Hollow and Filled With Lead.



Firebox Partly Completed. Shows Upper Drums and Mudring Installation of Water Tubes. No Stay Bolts Used in Construction of Firebox. None of the Studs Tapped into the Boiler Pass All the Way Through the Sheets, Hence There Can be no Leaky Studs or Stays. Note the Longitudinal Seams of Boiler Are of So-Called "Saw-Tooth" Octuple Riveted Design, which Provides Short Caulking Distance Between Rivets.

main pin, and the right hand link from the left hand crosshead through a transverse shaft.

Locomotive 60,000 is designed to traverse curves 17 degrees and has flanged tires on all the wheels. Lateral motion boxes are applied to the first driving axle. A Worthington feedwater heater of sufficient capacity to supply feedwater up to the maximum rate of evaporation is applied. The accessories are all operated by superheated steam at a reduced pressure of 250 pounds, except the feedwater heater and injector, which use saturated steam at 350 pounds.

The maximum evaporation obtained during extensive tests on the Altoona locomotive test plant was 69,695 lb. of steam per hour. The maximum equivalent evaporation was 84,184 lb. per hour, and at this rate of operation the steam pressure and temperature were well maintained. As the rate of firing was only 135 lb. per sq. ft. of grate per hour a higher rate of evaporation undoubtedly could have been attained if the locomotive had not reached the capacity of the testing plant. At a higher rate of evaporation, however, the boiler would have been unduly forced, and the figures given represent probably about the maximum evaporation likely to be reached in service. The boiler efficiency varies from about 70 per cent when 30 lb. of coal is fired per hour to about 52 per cent at the maximum rate, which as stated was about 135 lb. of dry coal per sq. ft. of grate per hour. This efficiency is about that of a well designed boiler of conventional design.

Study of the way in which heat is taken up by the boiler is permitted by measurements of the temperature at the center of the firebox, at the back flue sheet and in the smoke box. From these temperatures it is found that at a medium rate of evaporation the firebox takes up about 38 per cent of all the heat absorbed by the boiler, the evaporation flues about 52 per cent and the superheater about 10 per cent. The distribution of heat absorbtion is only slightly affected by the rate of operation.

Before considering the results obtained with locomotive 60,000 the general question of the use of high pressure steam in locomotive cylinders should be examined. In the first place it must be recognized that with a reciprocating locomotive two limiting conditions will obtain, irrespective of the steam pressure used. The first is that the temperature of the steam coming from the superheater will be about 650 degrees F., and the second is that exhaust must take place to the atmosphere.

A pound of steam at branch pipe pressure and temperature carries 1338 B.t.u. and the same pound of steam at exhaust pipe pressure and temperature carries 1164 B.t.u. The difference of 174 B.t.u. represents the energy taken from the steam and converted into work in the cylinders with the heat lost from the cylinders. This loss is small so that the difference between the total heat in the branch pipe and the total heat in the exhaust pipe represents

Guide and Crosshead Assembly. Crossheads of Underhung Multiple Bearing Type, Developed by J. T. Wallis, Chief of Motive Power, Pennsylvania Railroad.

TABLE 1

Test 7907	Pressure	Temp.	Heat Per Lb.
BRANCH PIPE	322 lb/sq. in.	652° F.	1338 B.T.U.
EXHAUST PIPE	11 lb/sq. in.	248° F.	1164 B.T.U.
DIFFERENCE			174 B.T.U.

closely the work done by the steam in passing through the cylinders.

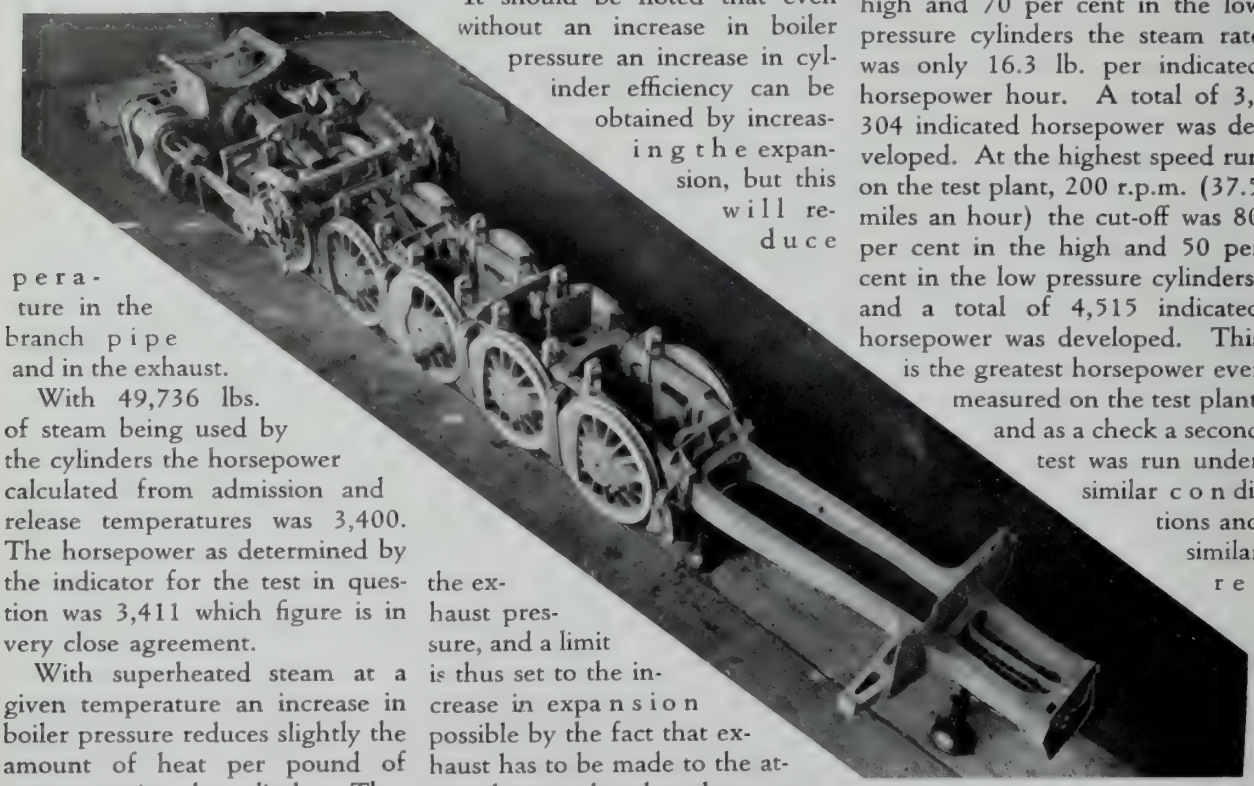
I am indebted for this idea to C. D. Barrett, assistant engineer of tests, of the Pennsylvania Railroad who pointed out that if the amount of steam passing through the cylinders is known the indicated horsepower can be determined without using an indicator, by measuring the pressure and temperature in the branch pipe and in the exhaust.

With 49,736 lbs. of steam being used by the cylinders the horsepower calculated from admission and release temperatures was 3,400. The horsepower as determined by the indicator for the test in question was 3,411 which figure is in very close agreement.

With superheated steam at a given temperature an increase in boiler pressure reduces slightly the amount of heat per pound of steam entering the cylinders. That is, the heat available for conversion into work is less. Therefore, to obtain an increase in the amount of work done per pound of steam it is necessary to reduce the heat in the exhaust steam as the boiler pressure is raised. In practice the release pressure or pressure at the end of expansion is maintained constant while the admission pressure is raised. To do this the higher pressure steam must be given a higher ratio of expansion. The longer expansion converts more heat into work and thus the steam from the higher pressure has less heat at release although the release pressure is the same in both cases.

In general terms, we may say that when steam is expanded to a given release pressure an increase in admission pressure will reduce the total amount of heat in the steam at release, but will require an increase in the ratio of expansion.

It should be noted that even without an increase in boiler pressure an increase in cylinder efficiency can be obtained by increasing the expansion, but this will reduce the exhaust pressure, and a limit is thus set to the increase in expansion possible by the fact that exhaust has to be made to the atmosphere so that the release pressure cannot be lowered indefinitely. Therefore, increase in boiler offers the greatest opportunity for increase in efficiency. At the same time the use of higher pressure has the mechanical advantage that the power obtainable from a given cylinder volume is increased. The necessity for a high ratio of expansion led to the use of compound cylinders on locomotive 60,000. A higher expansion than is usual could have been obtained in two cylinders, by using special valves and valve motion, but generally it seems simpler to use three cylinders and compound them. The three cylinders also have the advantage of reducing by one third the power to be transmitted by any one piston. With three cylinders decided on, the compounding adds no further complication.



Birds Eye View of Running Gear. Assembly of Inside Cylinder. Note Two Valve Motions on Right Side, Which Control Steam Distribution to Inside (High-Pressure) and Right Hand (Low-Pressure) Cylinders.

Indicator diagrams taken on the locomotive test plant at Altoona show that the steam used in this test was only 14.2 lb. per indicated horsepower which is the lowest figure ever shown on any locomotive, on a locomotive test plant.

At 80 r.p.m. (15 miles an hour) and cut-offs of 90 per cent in the high and 70 per cent in the low pressure cylinders the steam rate was only 16.3 lb. per indicated horsepower hour. A total of 3,304 indicated horsepower was developed. At the highest speed run on the test plant, 200 r.p.m. (37.5 miles an hour) the cut-off was 80 per cent in the high and 50 per cent in the low pressure cylinders, and a total of 4,515 indicated horsepower was developed. This is the greatest horsepower ever measured on the test plant, and as a check a second test was run under similar conditions and similar results were obtained. Each test was of one hour's duration, and the average water rate for both tests was 15.15 lb. per indicated horsepower hour. For all cut-offs from 50 per cent in the high and 20 per cent in the low pressure cylinders to 80 per cent high and 50 per cent low, and for all speeds from 80 to 160 r.p.m. (15 to 30 miles per hour) the water rate lies

TABLE 2

ONE POUND OF STEAM AT 650°F.

Expansion from 205 lb. per sq. in.

	Pressure	Quality	Volume	Heat
At Admission	205 lb/sq. in.	260° Supr'ht	2.92 Cu. ft.	1346 B.T.U.
At Release	45/lb/sq. in.	66° Supr'ht	7.91 Cu. ft.	1212 B.T.U.
After Exhaust	10 lb/sq. in.	22° Supr'ht		1171 B.T.U.

Energy converted to work = 1346—1171 = 175 B.T.U.

Number of Expansions = 7.91 = 2.7
2.92

Expansion from 335 lb. per sq. in.

	Pressure	Quality	Volume	Heat
At Admission	335 lb/sq. in.	218° Supr'ht	1.91 Cu. ft.	1338 B.T.U.
At Release	45 lb./sq. in.	0.99% Dry	7.10 Cu. ft.	1168 B.T.U.
After Exhaust	10 lb/sq. in.	0.96% Dry		1122 B.T.U.

Energy converted to work = 1338—1122 = 216 B.T.U.

Number of Expansions = 7.10 = 3.7
1.91

between 14.2 and 15.2 pounds per indicated horsepower hour, and even at a 90 per cent high and 70 per cent low pressure cut-off the water rate is only 16.3 lb. at 15 miles an hour and 16.6 lb. at 22.5 miles an hour. Examination of the information available from published records shows that the best water rate on record for an American freight locomotive ranges from 15.5 to 19 lbs., these figures being obtained with 250 pounds per square inch boiler pressure. The usual modern locomotive with a boiler pressure of 200 lb. per sq. in. and a possible full stroke cut-off usually will have a water rate ranging from 17 to 27 lb. per indicated horsepower hour. It is evident that in locomotive 60,000 the combination of high boiler pressure and compound cylinders gives a high degree of engine efficiency.

The maximum drawbar pull measured on the plant ranged from 70,000 lb. at 15 miles an hour to 35,000 at 37.5 miles an hour. Tests made in road service with a dynamometer car have shown slightly higher figures at speeds above 15 miles an hour, and a maximum pull of 87,000 in a stalling test. Since leaving the locomotive test plant, locomotive 60,000 has been lent for trial to six railroads and has run between 20,000-25,000 miles in tests. These tests confirm throughout the results obtained on the test plant. In fact, the dynamometer car records show slightly higher draw bar pulls than were obtained in the plant tests. On the Pennsylvania between Enola, Pa. and West Morrisville, N. J., 132 miles, against a ruling 0.3 per cent grade, an average of three runs with 6,241 tons showed 41 lbs. of coal per 1,000 gross ton miles, and one run with 6,589 tons showed 39 lbs. per 1,000 gross ton mile. On the Baltimore & Ohio on the 118 miles between Connelsville, Pa. and New Castle, Pa. a run with 3,346 tons gave 60 lb. of coal per 1,000 gross ton miles, while with 4,068 tons the coal consumption was 53 lb. per 1,000 gross ton miles. On the Burlington 7,080 tons were hauled 120 miles from Centralia, to Beardstown, Ill., with a coal consumption of 53 lb. per 1,000 gross ton miles. From Beardstown to Galesburg 7,528 tons were hauled with a coal consumption of 57 lb. per 1,000 gross ton miles. Our observation leads us to believe that when compared with well designed modern locomotives on runs of this character, locomotive 60,000 will show a saving of from 10 to 20 per cent in consumption of coal per ton mile. It is believed the figures given show the economy obtainable with high steam pressure and long expansion.

A great deal more could be said on this subject. I hope before long to publish a more complete study of the thermodynamics of the cylinder action. For the present let me say I believe the results so far obtained are such that in future any locomotive designer who is aiming at the greatest possible power unit of locomotive weight will be forced to give careful consideration to the possibilities inherent in higher boiler pressure and a long expansion.

Heavier Rail For Heavier Traffic

The production of steel rails with a weight of 100 pounds and over per yard has more than doubled in the last ten years.

In 1926 the production of such rails totaled 1,966,440 tons, an increase of 20 per cent over the previous high record—that of 1925.

The main method of producing more economical operation is increasing the amount of tonnage moved in a single train. This means larger and heavier locomotives and bigger and more heavily loaded cars, plus more cars in each train. To provide a track which will stand up under the constant operation of such trains and which can be economically maintained requires heavier rail and more ballast.

Growth of the weight of the rail has been continuous since railroad operation began. In 1830 rails of 33 and 35 pounds supported the first steam locomotives. Shortly afterward they were increased to 50 pounds and to 65. This weight was increased gradually as the need became more apparent, until by 1914 it had reached 85 to 90 pounds, which were used to replace the lighter rail as it wore out. On roads of very heavy traffic a weight of from 100 to 125 pounds recently came into use. During the past year, a record was made not only in the production of 100-pound rail, but also in the total production of steel rails.

What the Papers Say

THE habit of thrift brings money and property to the man who practices it. He lives within his income, saves constantly, invests prudently. His industry never lags. He always has what the unthinking call "good luck." Year after year his store increases. Fear of poverty is banished. He lives in plenty. The desire to spend which torments so many who have little to spend, does not bother him; for with the prosperity his thrift brings he learns true values and comes to know and dislike waste, indulgence, and every form of extravagance.

The habit of thrift robs of no proper pleasure, clouds no worthy outlook, narrows no life, hampers no laudable purpose. On the contrary, for the sound character it adds immensely to the joys of existence, widens every prospect for usefulness and honor, broadens the horizon of opportunity, and makes possible the realization of lofty aspirations. And with it goes from its humblest beginnings a contentment, a sense of well-being, a consciousness of right conduct, a confidence in both present and future, which no prodigal, no waster, no idler, no crook, however talented, can ever feel or know. Verily, thrift is blessed.—Chicago Journal of Commerce.

Trip for the Frisco's Veterans to France

Hundreds of ex-service men now in the employ of the Frisco System will have the opportunity of attending the national convention of the American Legion in Paris, France this fall following an announcement made by James M. Kurn, president of the Frisco. Mr. Kurn stated that any bona fide ex-service men now employed by the Frisco, who wish to attend the convention might have a leave of absence, and that the railroad would request free transportation to the seaboard for the veterans, and in addition try to secure free or reduced rate transportation across the Atlantic. Although Frisco records do not show the number of ex-service men in the company's employ, there are many of them among the 30,000 Frisco workers employed in nine southwestern states.

Why Wrigley Advertises

A short time ago, Mr. Wrigley, manufacturer of Wrigley's gum, was making a trip on one of America's fastest trains. He met a friend and the conversation turned to advertising. The friend said, "Mr. Wrigley, you have been spending millions of dollars in advertising for years. Why don't you drop your advertising for a year and save all that money?" Mr. Wrigley said, "This train is going at a pretty good clip isn't it?" The friend answered "yes." Mr. Wrigley then asked, "How long do you suppose it would continue to go if they took the locomotive away?" —Building Materials, Chicago.

Giving the Public Facts

Instead of giving out facts about our industries, under compulsion, as a sop to the public, many of our larger corporations recognize publicity as a legitimate and vital means of retaining the confidence of the public. Any business man who wants to keep the facts of his business to himself still has the right to do so. He may protect that right by the simple expedient of keeping his business so small that whatever he may do will be of no public consequence. In that position, if he attempts to push prices too far down, he finds himself without customers or workers. This price for his secrecy is obviously more than the right it maintains is worth.—Judge Elbert H. Gary, Chairman, United States Steel Corporation.

German Train Name Contest

Under the slogan, "Eight Trains in Search of Names," the German railway administration started a prize contest in July for the most catching, romantic or jazz names for the principal express trains between Berlin and Frankfort, Hamburg, Cologne and Munich.

Railroads Always Are Handy

Motorists trapped near Elmdale, Kan., by recent floods connived unusual schemes for getting away safely. One of the most noteworthy was that of Reece McGee of California, who with his family and the family of a friend, were en route home from New York City.

Finding the party trapped by waterlogged roads, McGee ordered from the agent at Elmdale a freight car. In this the two motor cars were placed and the party escaped the flood zone.

No one understands better than the railroad executives themselves that big problems still must be solved before the carriers can expect any great era of sustained prosperity, but that the managements diligently are putting their minds, hands and hearts to the task is encouragement of a new order for railroad investors.—Paul Willard Garrett, Financial Editor, New York Evening Post.

Wild Cats *in the* Motor Field

by

G. K. McCabe

Dept. of Economics,
Yale University

Travel Has Increased Largely in the Black Hills Country Since President Coolidge Moved There for the Summer. Rapid City Station, Chicago & North Western R. R.

BEANBLOSSOM, Sidney R. Common carrier of passengers; location: Mauckport; gross revenue $492.55. Clifford Carpenter, Anderson, gross revenue $560.25. So goes the list of common carriers by motor in the reports of public utility commissioners. Syd. is able to show a small profit by charging nothing for his labor as driver of his own car. Cliff comes out ahead because his tires are immortals. A blowout would wipe out most of his profits for the year.

There were 18 carriers operating under similar conditions in Indiana in 1926 reporting less than $1,000 gross revenue. In the same state 142 took in less than $10,000. Nor is this condition exceptional. A glance at Chart 2 shows that Indiana averages a larger number of buses per operating company than the other states. The reason for the multiplicity of operating concerns may be summarized as follows:

Operator-owners do not count their wages as a cost of producing the service. There were ten operators in Indiana who did not report any wage payment at all in 1926.

Failure to reckon as costs, depreciation and interest on the capital invested. Most of the Indiana operators reported no interest, and only a few in the lower group reported any charge for depreciation.

The large profits and spectacular growth of a few metropolitan companies have lured the $2,000 capitalists into the bus "game."

Failure to realize that the bus

Prof. G. K. McCabe, Yale University.

competes with the private automobile. The Toronto transit commission found that a bus line from the residential section of the shopping district would pay only in the winter months unfavorable to driving.

No comment is necessary on the fatuity of the haphazard cost accounting indicated in the foregoing, but a few words might be added on the alluring profits of the few metropolitan carriers.

The novelty of bus riding, the traction paralysis of 1919, and the uncongested condition of the boulevards at that time, resulted in fat profit margins, and a mushroom growth of bus lines in the largest cities. Since then the traction companies have modernized their equipment and so many bus riders have bought their own cars that boulevard congestion has slowed the bus lines down to a speed lower than that of the competing street car lines. On the other hand the falling price level has given the 10 cent fare better purchasing power; so that the bus lines in the centers of population have enjoyed good net earnings in spite of these obstacles.

However, a noticeable decline in the return on the capital invested has occurred in the last two years. A survey (Chart 3) of the income statement of the New York Transportation Co. (a holding company for the New York, Chicago and St. Louis operating companies) shows that the net income after taxes, but before interest, was no larger in 1926 than in 1920. In the meantime the capital investment has doubled.

The same tendency toward declining, or at best stationary rate

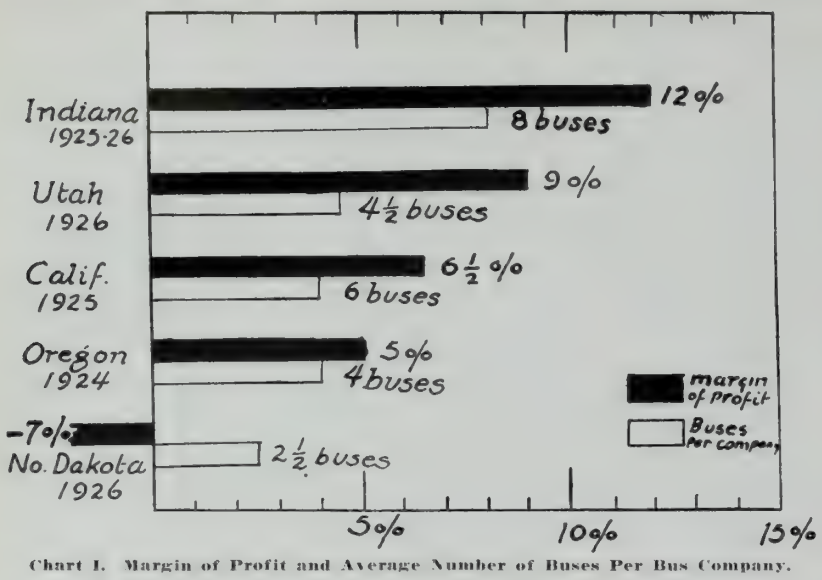


Chart I. Margin of Profit and Average Number of Buses Per Bus Company.

of return on the investment is discernable in the statements of the London (Eng.) General Omnibus Co., the Detroit Motor Bus Co. and the Peoples Motor Coach Co. of Indianapolis.

Even if the profits in the metropolitan field were mounting they would supply no proof that bus operation in the country or in the interurban field is profitable. Let the dirt farmer, about to convert his broad acres into a glittering bus, note that the interurban carriers operate at a heavy loss or at best on a very narrow margin of profit. The Connecticut Company operating over 100 buses, mainly in the interurban field, earned in 1925 a net profit of only $4,234.

This narrow margin of profit has resulted in a wholesome tendency toward consolidation. Chart 2 indicates the increase in the number of buses per operating concern. Since 1924 the number of buses per company has doubled in Indiana. Similarly in California the number of bus operators have decreased from 458 to 400 despite an increase in the number of vehicles operated. On this point the public service commissioners of the state of New York report (p. 46, 1925):

"In the early development of the bus service no attempt was made to coordinate lines. They were developed and operated as the immediate needs dictated, and as the financial ability of the operator permitted. Too often the available capital was so slender that the equipment soon suffered from inadequate maintenance and in many instances the original operator disappeared, to be followed by an equally enthusiastic and poorly equipped successor. The past year, (1925), however, has presented a rather wholesome consolidation of such lines into systems extending over wide areas, back of which there are adequate financial resources to permit the lines to be efficiently and successfully operated. The close of the year finds these lines just beginning to function at their best."

In the same vein the Michigan public utilities commission reports for 1925 (page 11):

"Statistics on bus operation show that route mileages have increased since 1923, while the number of operators has decreased. This decrease is due to the fact that many lines have extended their routes, and many consolidations of operations have been effected. This has had a tendency to increase greatly the efficiency of the bus transportation utility."

For the country as a whole the number of operating concerns rose in 1926 from 6,455 to 7,215. The increase in the number of buses more than offset this, so that the average number of buses operated by each carrier rose from 4.4 to 4.5 (Table I).

The importance of the consolidation movement from the point of view of the operators is shown in Chart 1. This comparison of the margin of profit in several states seems to indicate that the size of the profit margin varies directly with the average size of the operating concern. Thus, Indiana makes the best showing with a margin of profit of 12 per cent before interest or depreciation, and eight buses per operator. Of course there are far too many "shoestring" bus operators there, as indicated in the foregoing, but the situation is far better in Indiana than in states like North Dakota. In the Northwest we find only 2½ buses on the average operated by each concern. It is

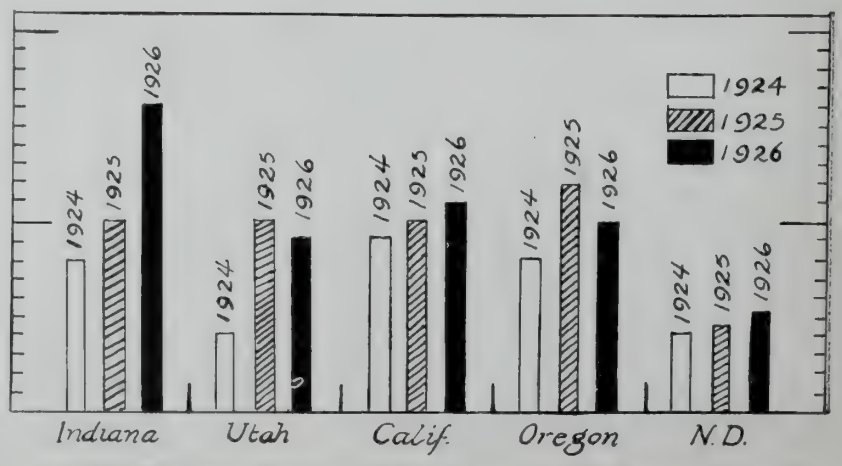


Chart II. The Average Number of Vehicles Operated Per Company 1924-1926.

Table 1. Common Carrier Bus Concerns and Number of Buses Operated:

		1924	1925	1926
California	Buses	2296	2253	2440
	Companies	514	458	400
Indiana	Buses	807	846	1116
	Companies	213	173	143
Utah	Buses	108	304	277
	Companies	45	65	63
Connecticut	Buses	341	483	550
	Companies	68	78	70
Virginia	Buses	618	565	595
	Companies	183	185	224
Maryland	Buses	336	360	391
	Companies	57	155	163
North Dakota	Buses	59	70	85
	Companies	31	31	35
Oregon	Buses	325	571	649
	Companies	82	98	150
Total U. S.	Buses	34,350	28,145	32,425
	Companies	6,551	6,455	7,215

(Data from "Facts and Figures," National Automobile Chamber of Commerce.)

small wonder then, that the margin of profit is less than zero.

It is to be hoped that greater publicity of bus company earnings and closer scrutiny of credits extended to bus purchasers will hasten the consolidation movement. Other forces guiding the industry in this direction are: purchase of lines by traction and railroad companies; heavier taxation; the extension of the regulatory hand of public utility commissions to this field; compulsory liability insurance; city congestion forcing terminal expenses on the operator.

An optimistic note is sounded in the report of the Washington state department of public works: "Prior to the passage of this law there were, during ideal weather and road conditions, 12 operators serving a given route who raced over the highway competing with one another for the intermediate business, and the added advantage of arriving at the other terminus first in the hope of securing full loads for the round trip. This route is now being served by one operator, giving service upon a regular schedule with far superior equipment."

Free Bus For Churchmen

They get them into church, one way or another, down in Boston. Now the bus proves useful in gathering and transporting the lazy or ungodly. By providing free bus service to Old North Church, Dr. Ernest J. Dennen has increased five-fold the average Sunday congregation in the historic edifice. Never in the 300 years of Boston's history have such methods been used to bring worshipers to service.

When the lantern in the steeple of Old North Church flashed its signal to Paul Revere the neighborhood was filled with communicants. Today the church is isolated in the narrow, crooked streets and lanes of old Boston, with the neighborhood inhabited by many thousands of noncommunicants.

Dr. Dennen found his average Sunday congregation numbered less than 40 when he began to preach there. Six successive Sundays have since brought an average of 200 to each service. Worshipers now gather on Boston Common, where the buses meet them. Doubtless, however, like the man who went to the stranger's funeral, some go just for the ride.

Meet the G. M. C. Family

The distinction of having the world's largest industrial family belongs to General Motors. This great commercial household is composed of more than 275,000 persons all of whom are directly connected with General Motors as employes, dealers and their employes, or stockholders.

Furthermore, if all the workers who go home in General Motors cars every day were organized into an automobile club, it would number more than 4,000,000 members.

A striking example of the interdependence of industries is provided by General Motors.

In 54 cities in this country, Canada, and overseas, General

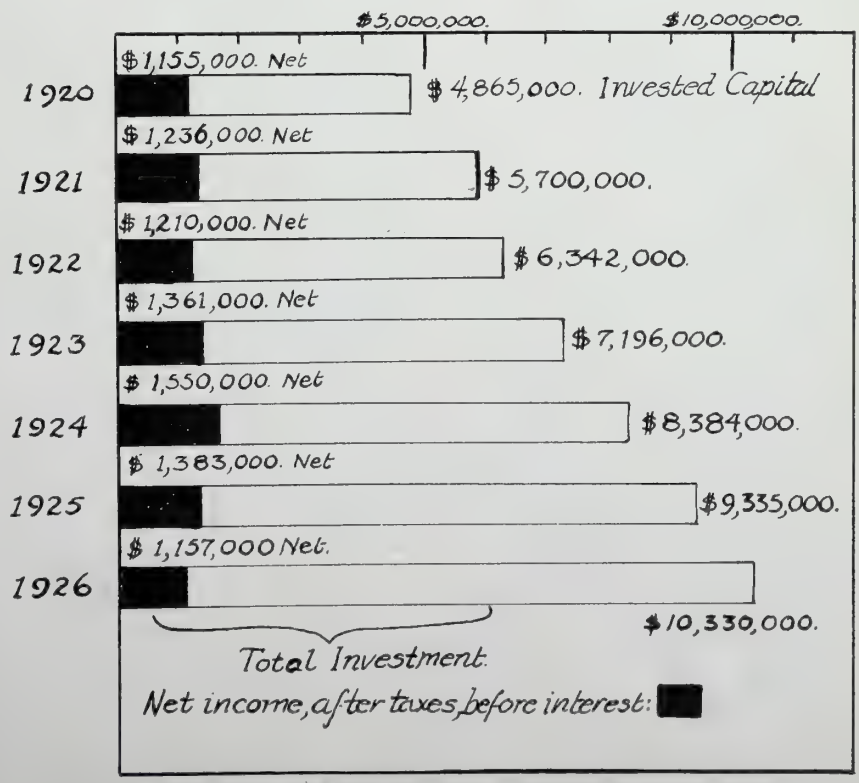


Chart III. Net Income and Invested Capital 1920-1926 New York State Transportation Co.

Motors has manufacturing operations, and some of these communities depend almost entirely upon General Motors for livelihood and progress.

In the United States alone General Motors buys material from 4,765 companies in 571 cities, towns, and villages.

There are General Motors plants and warehouses in 17 countries, and more than 33,000 General Motors dealer and service organizations are distributed among more than 100 countries throughout the world.

A group insurance policy in excess of $125,000,000 was recently taken out for General Motors employes.

In 1926 General Motors paid the railroads $74,000,000 freight charges, and used 515,000 full freight cars.

Few persons regard General Motors as an extensive buyer of food, yet purchases include supplies for 60 employes' restaurants. Other purchases include:

Enough cork to float a greater tonnage than the displacement of the steamships Olympic or Acquitania (25,000,000 board feet);

Sufficient upholstery to cover completely 2,200 football fields (100,000,000 square feet);

Steel and iron enough to fill a train 550 miles in length.

In addition General Motors buys gold, platinum, diamonds, tungsten, copper, brass, tin, zinc, coal, clay, cement, sand, gravel, lime, cotton, wool, silk, jute, hair, leather, glass, enamel, rubber, and many other materials.

Thus General Motors serves the world, and thus, also, the world serves General Motors. So complex and widespread are the ramifications of the present economic structure that no single industry is self-sufficing — each is dependent upon others.

In 1926, Fisher Body division, one of the largest members of the General Motors family, built more than half of the bodies made for automobiles with a base price in excess of $500.

One of the G. M. C. Heavy Duty Trucks in the Lumber Industry.

The story of the growth of Fisher Body reads like a fantasy. When the company was organized in 1908 it had a total of only 14,000 square feet of floor space, all in one small building. With the completion this year of their expansion program, Fisher Body plants in 19 cities will have a total of 16,000,000 square feet of floor space, and facilities for the manufacture of more than 1,500,000 motor car bodies annually. The number of persons employed by Fisher Body, with their families, would populate a city of 200,000.

One of the plants is equipped to make 1,800,000 complete body hardware assemblies each year, more than 6,000 a day. Fisher Body makes its own glass, and last year logged and milled 250,000,000 feet of lumber.

"But the size of a company, in itself, means little," explain officials of Fisher Body. "Our tremendous business has resulted in achievements impossible to attain otherwise. In addition to the well-known economies effected by large scale production and purchases, there have been advantages both to the dealer and to every person owning a motor car.

"Foremost among these benefits is the building of bodies for all classes of automobiles. Lessons learned in making lower priced bodies on a large scale have resulted in making our higher priced bodies better and less expensive. By building scores of thousands of high quality bodies of all kinds we have discovered points we have been able to incorporate to good advantage into bodies of low cost."

Speaking of Bus Transport

It's dangerous, usually, to say you were first with this or that or something else, but the Boston & Maine R. R. comes out bravely with this information. That company asks whether you chance to know that:

The Boston & Maine R. R. was the first company east of Chicago to replace passenger trains with buses?

The Boston & Maine started its first bus operations in the fall of 1924 on the Ashburnham branch?

The Boston & Maine Transportation Co. started bus operations in May, 1925?

Its first line replaced service formerly rendered by the Portsmouth Electric Street Ry.?

There are 88 persons employed by the Boston & Maine Transportation Co.?

Fifty-six buses were operated in 1926 covering 1,010,744 miles?

The largest buses seat 29 persons?

Maximum speed permitted by the operating rules is 35 miles an hour?

The speed of buses is regulated by a governor attached to the eccentric shaft which prevents a faster speed?

A complete stop not more than 50 nor less than 20 feet from the railroad crossing is required of Boston & Maine Transportation Co. operators and all tracks must be crossed in low gear?

Twenty-one routes covering 695 miles are operated?

Twelve thousand five hundred passengers were carried on Boston-to-Portland buses last year?

On four branch lines buses have replaced passenger trains?

On two main lines passenger trains have been partly replaced by bus service?

The longest route operated by the Boston & Maine Transportation Co. is from Boston to Bethlehem, N. H., 190 miles.

While ferry boats, used to take navy yard employes between Portsmouth and the navy yard, were out of commission, transportation was provided recently by Boston & Maine Transportation Co. buses.

Pickwick Stages to St. Louis Within 60 Days

Operations of the Pickwick stages will be extended over an all-year route from Los Angeles to St. Louis, within 60 days, and the system will be further extended to the Atlantic seaboard as soon as a logical route can be determined and other details have been completed, according to a statement by Charles F. Wren, president of the Pickwick Corp.

The Pickwick line, now in operation between Los Angeles and Oklahoma City extends over an all-year route connecting with Phoenix, Ariz.; El Paso and Amarillo, Tex., and Tulsa and Oklahoma City. Representatives of the company are now completing arrangements for the extension of the line though Joplin and Springfield, Mo., into St. Louis, and a branch line will be operated from Joplin to Kansas City. As soon as arrangements can be completed the system will be extended to Chicago.

For the first five months of 1927, net earnings of the system, exclusive of the corporation and holdings outside of the transportation unit itself, were $216,250, as against $49,286 in the same period of 1926, an increase of 339 per cent. During the five months' period this year the system carried 501,197 passengers.

More Parking Space Needed

The United States has one automobile in operation for each five of its citizens, the automobile division of the department of commerce announces. Statistics for the world as a whole showed 27,650,267 machines in operation at the beginning of the year, or one for each 66 of population.

—Underwood & Underwood Photo.

Germans Are Good Traders. Here Is An Automobile Store Traveling Through the Country, a Contrast to the Early Pedler Who Carried His Pack.

In Canada and Hawaii, there is one machine to each 11 of population, while New Zealand has one to 12, Australia and Denmark, one to 17; Great Britain, one to 43; Argentina, one to 45, and France, one to 46.

It was estimated that 95 per cent of all the automobiles operating in the world are of American origin, though a considerable proportion of them were assembled in foreign branches of American factories.

Baby Chicks in the Air

Within a day after they had pecked their way into the world, early in July, 350 chickens took an airplane ride from their native city of Sussex, England, to their present home in the Rhine-Hessian village of Gernsheim.

Hardly were they out of their shells when they were packed in a crate, sent to the Croydon airport, and taken by airplane to Cologne. There a truck took them to the railway station and a fast passenger train landed them in their new home before sundown.

Not a single chick was lost on the trip, it is said, and all chirped most of the way and on arrival. They were taken into Germany to improve certain German strains.

For Arc Welding Paper $17,500

The American Society of Mechanical Engineering has accepted the custody of $17,500 given by the Lincoln Electric Co. of Cleveland, to be awarded, under the rules of the competition, to those contributing the best three papers disclosing new information that will tend to advance the art of arc welding. There will be three prizes, first $10,000, second $5,000, and third $2,500. Anyone, anywhere, may compete. Information may be obtained from Calvin W. Rice, secretary, 29 West 39th street, New York.

"Now is the time; this is the hour; here is the moment of the best day in your life. Make good use of it."

Havelock Ellis says: Talent means the ability to do well what others have done already, while genius means the ability to do something new.

A Portable Filling Station

Here We Have a Filling Station On Wheels

AN International model SL speed truck chassis is used for the mounting of this unique filling station de luxe on wheels. The equipment is complete in every detail and includes:

Two 300-gallon gasoline tanks equipped with automatic pumps and visible measures.

Lubricating oil unit consisting of eight compartments with visible glass gauges, each compartment holding 15 gallons of oil.

One 60-gallon water tank, with hose at front and rear of truck.

One 60-gallon air tank supplied from two-cylinder air compressor at rear of motor, with two 30-foot hose connections at front and rear of truck.

One 14-gallon auxiliary air tank.

Four 200-hour storage batteries.

Four hinged jacks fastened to each corner of the truck chassis frame, so that the weight may be taken off the tires and springs while the station is in operation.

Four spirit levels so that the truck frame can be leveled for station operation.

Two fire extinguishers—one on each side—are provided.

Flood lights are used at the front and rear of the truck, as well as on the roof, for brilliantly lighting the station at night.

Large canopies over each side of the truck fitted with collapsing tubular posts or supports give the "Covered Wagon" effect and provide a covering for the two drive ways.

In addition to the above items, which are all essential to the proper operation of the station, other portable items may also be secured where it is desired to engage in a wider variety of activities, such as tool boxes, grease racks, etc.

The portable service station has a sedan-like finish, fitted with a comfortable cab, plate glass windows, nickel trimmings, and is attractively painted in white, green and red. Special insulation is used throughout, making the station safe from fire hazards. Space is also provided in the rear for greases and other small specialties.

Progress of Valuation Work

The Interstate Commerce Commission had served 931 tentative valuations up to December 31, 1926, of which 410 have become final by decision and order, according to a report just completed by Frederick H. Lee, secretary of the Presidents' Conference Committee on Federal Valuation of the Railroads. These 931 tentative and final valuations cover 181,928 miles of road, or 74½ per cent of the railroad mileage under valuation.

The work of placing a valuation upon the railway properties of the United States has been going on since 1913, when the Valuation Act was passed. During the 13 years ended June 30, 1926, the railroads spent $91,755,158 in connection with valuation. This expenditure was incurred in complying with the act, which requires the carriers to cooperate with the commission in this work. For the year ended June 30, 1926, the railroads spent $7,826,763.

The expenditures of the bureau of valuation of the Interstate Commerce Commission for the 13 years ending June 30, 1926, were approximately $28,256,027. For the year ended June 30, 1926, the bureau of valuation spent $1,593,830. In other words, the commission and the railroads have spent a total of $120,011,185 for valuation work in the 13 years up to June 30, 1926.

Keep Him Away From the Journal Boxes

General Superintendent Mays of the Illinois Central at Memphis contributed one of the Queer Things in July for the entertainment of Vice President Dawes, who spent a few moments in Memphis last week. Mr. Mays sent for William Watson, a negro car repairer, said to be "divinely inspired," and able to burn any object merely by blowing his breath on it. Presented to the Vice President, Watson asked for a handkerchief and Mr. Dawes let him have one, with the remark, "Well, I'll never see it again." Watson, true to his promise, blew his breath on it, and after a few mysterious puffs the handkerchief caught fire. Watson repeated the trick several times, while the Vice President puffed away at his underslung pipe.

The trick, however, went unexplained.

Queer Things That Happened in July

THE REASON isn't always clear, but the fact remains that airplanes frequently shed one or more wheels in leaving the earth or after they are in the air a few minutes. It happened twice in the week ended July 9, once at San Antonio and once at Washington. At the former place Cadet R. D. Johnson of Kelly Field lost a wheel from his landing gear while in the air. He landed without accident by being especially careful and thought no more about it until a few days later a farmer presented a bill for $5 worth of damages done one of his fine heifers by Johnson's wheel. The farmer said after the wheel struck the ground it bounced a few times and then landed on the cow's back which, as everyone knows, is contrary to the law in such cases made and provided. Johnson paid the five dollars.

At Washington a sight-seeing plane dropped a wheel into the Potomac. This plane had passengers, and Stewart Reiss, the pilot, had to land on one wheel and do it mighty carefully to avoid a serious crash, something few pilots have been able to do. But Reiss did it. He cut in his engine, informed his passengers what had happened, floated downward, dipped the plane over on the right side and made contact with the ground on the remaining wheel. After rolling a few feet the plane lost its balance, the axle for the missing wheel dug into the earth, the plane whirled around and came to a halt. The passengers alighted unscathed, while the crowd cheered.

Gas Masks for Riding Through Tunnels. These Masks Are Used by Railroad Men in Australia.

Dull Days in Sacramento

Not one automobile fatality during June in Sacramento! Ted Koening, chief of police, reported the first week of July that in the month just ended there had been 76 automobile collisions in his district and 46 persons were injured, so somebody must have been stirring about in the state capital. But no one was killed—not one was fatally injured.

Old Story But New Issue

You have all heard of the man who rushed frantically to the dock and sprang across five feet of water to the steamer's deck only to discover the boat wasn't leaving port but coming in. You've heard that one? Well, here it is again, in modern dress, and truthful, too. The story came from Boston this time, July 8. "By this and that I had a narrow margin this time," said a traveling man after he boarded a train that was just pulling out of the station at Essex Junction, Vt., after the traveling man, at a cost of $3.50, had made a rapid taxi trip from Burlington to Essex Junction to catch the train to Montreal. When the conductor came along in a few minutes later the salesman learned that he had boarded the wrong train and was on his way back to Burlington.

An Aerial Cigar Store

A flying cigar store is the latest in aerial developments. The familiar red and gold lettered signs, prominent on street corners throughout the country, arranged to hop off on a trip through the clouds on July 5. The plane is a giant twin motored Sikorsky. It will visit Schnectady, Rochester, Buffalo, Cleveland, Detroit, Chicago, and St. Louis, returning by way of Pittsburgh, Washington, and Philadelphia. It is stocked with a complete line of merchandise, will make frequent stops en route and will dispense merchandise at all landings.

Erie No. 3 On Time That Day

When Erie train No. 3 from New York stopped at Huntington, Ind., July 2, to change engines, a

woman from a Pullman car hurried up to Engineer Raymond W. Ferris.

"We're 40 minutes late," she said, her voice trembling, "and that means I'll miss my connection in Chicago. My mother is desperately ill in California and I must get to her. My name is Mrs. Ethel McVickers, and" — she grasped the engineer's hand. "Can you possibly make up that 40 minutes?"

"I'll try," he assured her.

Erie No. 3 arrived in Chicago "on time."

A Busy Glass Patrol

Four tons of broken glass have been collected from the streets of Detroit in three months, according to the Detroit Automobile Club, which runs a "glass patrol" especially to keep shattered glass off the pavements. Placed in service in February, the patrol's big truck circulates throughout the city, cleaning up the broken fragments so commonly seen after mishaps. Automotive experts of Detroit assert that these figures, the first of their kind collected, reveal the magnitude of the glass threat to the tires of passing cars. They also find, in the glass patrol's work, evidence in favor of the use, in automobile windshields and windows, of safety glass which because of its triplex construction, does not shatter upon impact.

Train on Jacob's Ladder, Mt. Washington Railway, N. H. (Boston & Maine).

Here's a Sturdy Workman

Although a 25-foot steel bar three-fourths of an inch in diameter passed through Paul Koty's head 12 days ago, he is alive today and conscious. He talks, hears and eats.

Koty was injured at the La Salle steel plant at Hammond, Ind., when he leaned over near the end of a mill planing bench. The bar struck him in the neck on the left side, passed through his mouth and brain and out the right side of his head. He suffered four definite skull fractures. The bar lacked only four inches of passing completely through his head.

Koty helped doctors pull the bar the remaining distance through. He has every chance for recovery, doctors at St. Margaret's Hospital say. He is 37 years of age and the father of 3 small children.

Atlantic Coast Line Railroad Freight on James River Bridge, Richmond, Virginia.

Powder in the Coal Box

The engine of a westbound Baltimore & Ohio train from Harpers Ferry narrowly escaped being blown up near Winchester, Va., July 8. Earl Horn, fireman, discovered a large keg of powder in the coal pit on the tender as he was shoveling the keg into the fire box with the coal.

A Brave Old Towerman

At Vernon, Texas, early in July, a report that efforts had been made to compel him to derail the northbound "West Texan," Fort Worth & Denver passenger train, was made by J. D. Ferguson, 74 years of age, towerman at the crossing of that railroad with the Frisco. Ferguson said three men

entered the tower as the train approached and ordered him to open the derail. Although they were armed and threatening, he said he gave the all-clear signal. As the train dashed by they attacked him and knocked him unconscious.

Head End Collision

While running on a freight train between Duddingston and Newcastle, Scotland, recently, William Graham, the fireman, accidentally fell off the engine, landed on his head, and was severely injured, the train running a considerable distance before it could be stopped.

Thirteen Surely Unlucky

Some time ago the president of the A., T. & S. F., Coast Lines, promulgated a rule that no employe of the company could bring alcoholic liquor on the company's property.

So when Section Foreman W. H. Bush, of El Segundo, Cal., found 13 gallons of white corn whiskey on the right-of-way of the bone-dry Santa Fe railroad, he forwarded a hot protest to the division superintendent. The "super" called the sheriff's office and Capt. J. M. Benton of the liquor squad sent a flying squadron to take care of the contraband corn.

Now Capt. Benton is looking for the careless bootlegger who left his wares on railroad property.

—Underwood & Underwood Photo.
How the Union Pacific Covers Its Ties on Bridges to Protect Them From Fire.

Thrill Seeker, Perhaps

Some one, perhaps a demented person or a small boy at play, half opened a switch in the tracks of the Nickel Plate railroad at 83rd street and Woodlawn avenue, Chicago, one day in July, resulting in the serious injury of a woman passenger and several others when an incoming train from New York was derailed and toppled over an embankment. Only the fact that the derailed coaches were of steel construction prevented loss of life, officials declared.

It's Really No Joke

Passing of another "great American institution" was presaged in New York in July when Edward F. Albee, president of Keith-Albee theatres, sent a letter to actors playing the company's circuit asking them to stop derogatory jesting about electric railway lines.

Branding the quips on trolley service as neither comedy nor entertainment and often "cheap jokes," Mr. Albee asked the actors to spare the vehicle that, in many cases, brought patrons to theatre doors.

Lack of motoring manners is a major cause of the 23,000 fatalities resulting from auto accidents throughout the country each year, is the charge made by an eastern safety council recently.

A Good Contrast for Summer Readers. Steaming Iron Ore at Proctor, Minnesota, Duluth, Missabe & Northern R. R. Steaming is Necessary Before Ore Can Be Unloaded in the Winter.

This Is A Modern Draw Bridge

ROOSEVELT avenue bridge, New York, the largest trunnion bascule lift bridge east of Chicago, and probably the largest of its exact type in the world, will soon carry Manhattan subway trains across Flushing River to Flushing, Long Island.

The bridge consists of two movable leaves which turn upon huge trunnions and open like the blades of a jackknife to permit the passage of ships. Each leaf is 152 feet long and weighs close to four million pounds. So delicately is this great weight counter-balanced, however, that four 80-horsepower electric motors can open or close the bridge in 45 seconds against the pressure of a 25-mile-an-hour wind. Three hundred and twenty-eight horsepower of Westinghouse motors provide the motive power. The clear height of the bridge is 25.6 feet above mean high water, which is sufficient to permit the passage of ordinary tug-boat traffic without opening the bridge. An unusual feature of this bridge is that it is double-decked. The upper level will carry three rapid-transit railroad tracks, and the lower will provide a very much needed vehicular thoroughfare for this locality.

Special attention has been given to insuring complete safety in the operation of this bridge. Engineers of the department of plant and structures of New York, assisted by the engineers of the Westinghouse Company, have devised a system that is regarded as completely adequate. When a ship, which is unable to go under the bridge, wishes to pass up the river, it signals the bridge operator. The operator is unable to move the bridge, however, for all motive power circuits are normally dead. His first act is to signal to the towerman controlling the operation of the trains that he wishes to open the bridge. The towerman sets the signals against the trains, which, however, he cannot do until the bridge and its approaches are clear of trains, and this operation automatically energizes the bridge's motive power circuits. The bridge operator now is able to start successively the various motors which perform the following functions:

1. To withdraw two huge steel bolts, weighing 400 pounds apiece, which lock the two leaves of the bridge together while in closed position.

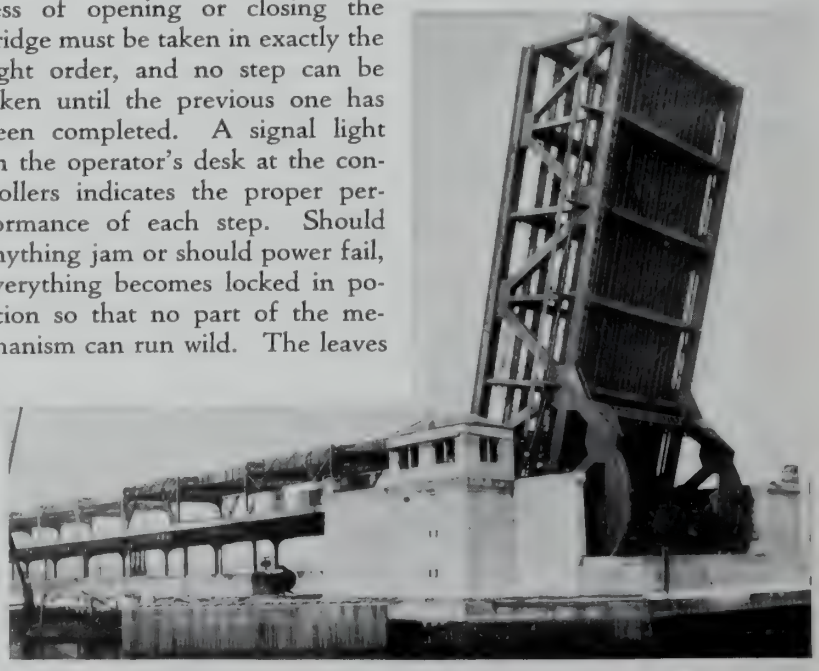
2. After the bolts are fully withdrawn the tail lock struts which brace the bridge leaves at their shore ends are withdrawn.

3. The bridge leaves are lifted and open the way for the vessel.

After the vessel passes the bridge operator closes the bridge and locks it, and not until everything is in perfect order, can the towerman set "clear" signals for the trains. This system is so arranged that each step in the process of opening or closing the bridge must be taken in exactly the right order, and no step can be taken until the previous one has been completed. A signal light on the operator's desk at the controllers indicates the proper performance of each step. Should anything jam or should power fail, everything becomes locked in position so that no part of the mechanism can run wild. The leaves do not open or close completely in a single movement, but stop just before they reach the end of their travel, the last few inches being taken at a very low speed. This prevents damaging the bridge structure by slamming it against the stops. Duplicate motive power equipment is provided to insure continuous operation should any piece of apparatus go out of commission for any reason.

The total cost of the bridge and its approaches is $2,700,000. The Arthur McMullen Co. is the general contractor, and the McClintic-Marshall Co. has fabricated and erected the steel superstructure.

Hoboes along railroad tracks are the direct cause of many hot boxes which have been delaying transcontinental freight trains, detectives report. The chill autumn night air necessitates a good camp fire and the hoboes claw out the oil-soaked waste packed around axle journals of freight cars. The material thus obtained provides a long, hot fire. Axle journals minus the cooling oil soon become overheated and burst into flames, which melts the babbitt fillings. — Los Angeles Express.



One Section of the Big Bridge at Roosevelt Avenue, New York. Note the Double Deck.

Here's A New Four Cycle Diesel

High Compression Solid Injection

By Harvey Wells

THE widespread interest in Diesel engine developments, among railroad and steamship managers, gives particular value to the engines now being built by the Chicago Pneumatic Tool Co. in the company's plant at Franklin, Pa. These are four-cycle, high compression, solid injection types under license from the Motoren-Werke-Manheim, A-G, Vorm Benz. This is a division of the Benz Company which has been engaged in the manufacture of Diesel engines for many years although its activities have been confined largely to marine engines, especially those for submarine service.

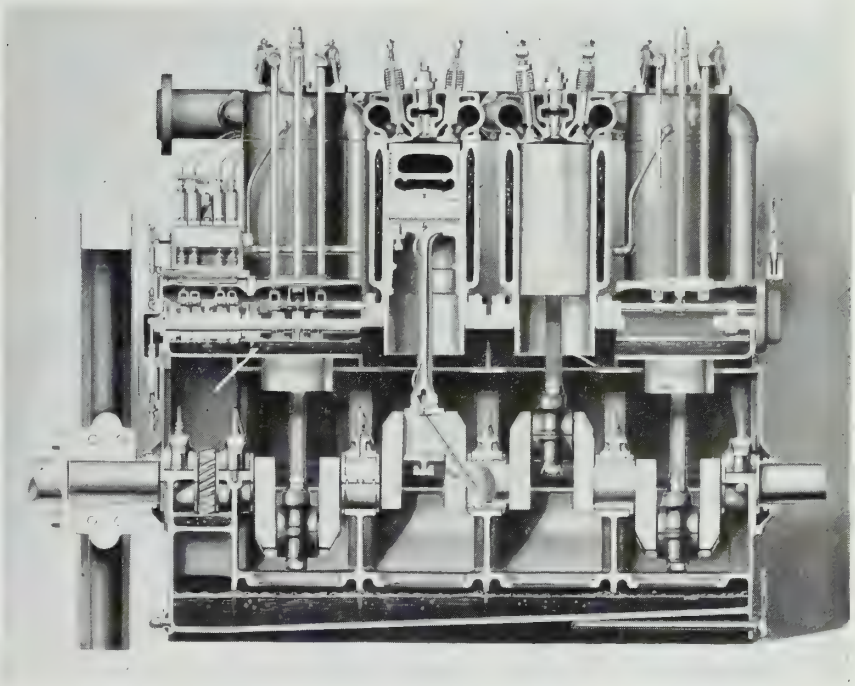


Fig. 1. Sectional Front View of Type RH 40V Diesel Engine.

The first Diesel engines built were of the air injection type. Later, the solid injection type of engine was found to have certain advantages over the original air injection used by Dr. Rudolf Diesel. The Benz Company developed a mechanical injection engine and called it the RH type to distinguish it from the D or air injection type. Thus we have the RH 35, the abbreviation of Rohl-Hochdruck meaning, literally, "Fuel-Oil, High Pressure," the number 35 corresponding to the stroke in centimeters. In changing the German drawings to suit American practice the same nomenclature is kept, excepting the numerals.

The engine made at Franklin, Pa., is built with two, three, four and six cylinders rated at 80, 120, 160, and 240 B. H. P. at 327 R. P. M. The two cylinder 80 h.p. engine, weighs 170 pounds per horsepower, while the six cylinder, 240 h.p. engine, weighs just 100 pounds per horsepower.

The first application of these American built engines has been to gas compressor drives. A number of specially designed engine compressor units have been in service for some time. Other units are being placed in service, and still other larger compressor-engine units are under construction. The engines are intended for the small, general power purposes and isolated or small power plant drives, and as stand-by units in larger power stations. As its type designation, RH, indicates, the compression pressure used is high, creating sufficient heat to self-ignite and burn completely the fuel injected.

In performance the engine ranks well up in the list of Diesels. Fuel consumption reaches the low value of .40 pound per B. H. P. hour based on fuel having a minimum heating value of 19000 B. T. U. per pound. The moderate engine speed of 327 R. P. M. coordinates well with the two-stage consumption obtained with the engine. Such a speed allows the proper amount of time for the various progressive steps in the combustion system described. Many grades of fuel oil require considerable time for vaporization of gasification, and at higher speeds it is often difficult to obtain perfect combustion, without which there is, of course, a decrease in economy. The class of fuels that can be used include all the commercial grades of Diesel fuels commonly sold in the United States. Lubricating oil consumption is at the rate of 2500 B. H. P. hours per gallon.

Scientific selection of materials and careful manufacture combined with German thoroughness and knowledge of design insure the reliable performance of the engine. Tested during the war in the most exacting and strenuous way, submarine engine service, the engine was found thoroughly reliable and long-lived. Improved since the war and redesigned it is certain that

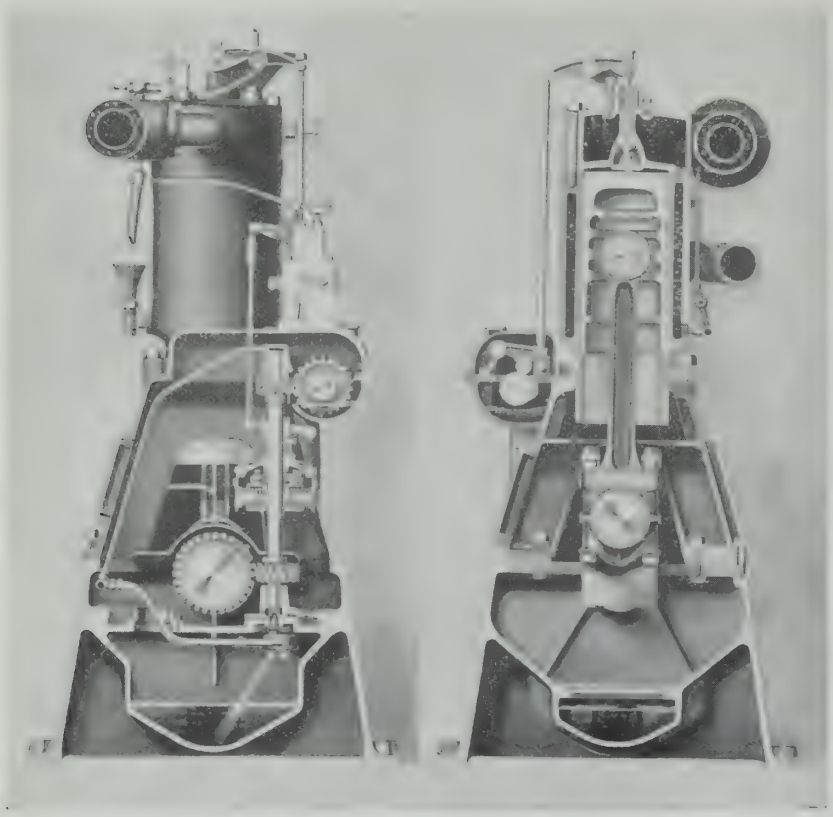


Fig. 2. Sectional Side Views of Type RH 40V Diesel Engine.

none of its reliability has been lost, and the performance of industrial engines now in service testifies to its probable longevity. All such parts as cylinders, pistons, bearings, valves and injection apparatus are the result of progressive experimentation and constant improvement. The German builds for the future, and in the design of this engine his handiwork is apparent in the precautions taken to insure the life of the engine. Adjustment has been provided for those parts absolutely requiring adjustment, but beyond this, parts are designed for a fixed setting that is made in the factory test. In other words the engine is foolproof to a high degree.

Lubricating oil filter and cooler and the use of the pressure system insure the bearings against wear; fuel oil is thoroughly filtered before it reaches any part of the fuel injection system; cooling is uniform and thorough; all adjustments requiring any degree of skill are yearly jobs; service engineers will have expert advice and instructions to give for such occasions to prevent blundering.

The engine is of the vertical, four stroke cycle, high compression, solid injection type. It is single acting, employing the trunk type of piston. Each cylinder has an overhead inlet and an exhaust valve in the cylinder head operated by rocket arms, push rods and levers from cams on a horizontal camshaft geared to the crankshaft.

The combustion system of the M. W. M. Benz is the feature which distinguishes it from other Diesel engines, and is responsible for the excellent economy of the engine. No air is employed in the injection process. Fuel is delivered to and atomized through the fuel injection nozzle by hydraulic pressure of 950 pounds developed by direct acting plunger pumps, so driven as to deliver a timed charge of the desired quantity. Passing through the injection nozzle this fuel is sprayed into a pre-combustion chamber in the center of the cylinder head. Here the atomized oil, meeting the highly heated air of compression, is converted into a combustible oil gas, due to the fact that the pre-combustion chamber is so proportioned as to contain only a portion of the air compressed in the cylinder, consequently incomplete combustion takes place. A rise in pressure occurs in the pre-combustion chamber, and the combustible gas is driven out of the chamber through a mixing nozzle into the cylinder combustion space, where, upon meeting a fresh supply of air, complete combustion ensues at a progressive rate and pressures only slightly above compression pressures are developed.

The system is the result of a long series of systematic experiments and investigations, which resulted in the trial and elimination of a great number of apparently logical theories in regard to combustion.

The mixing nozzle is fitted closely into the cylinder head with considerable surface in contact with the water jacketed space, a necessary precaution in prolonging the life of the nozzle and in controlling the combustion period. The injection nozzle spray is directed into the upper end of the cone shaped nozzle surface where it meets the highly turbulent air, when the initial combustion stage developes. Any raw fuel settles on the combustion nozzle and the subsequent out-rush of gas carries it through the mixing holes by which time it has vaporized and is ready for complete combustion in the fresher air of the cylinder combustion space. The heat control is so accurately gauged that carboning up of the combustion chamber is practically unknown. The close coordination of the timing of injection, compression pressure, and design of the pre-combustion chamber are the controlling factors in the high fuel economy obtained.

The charge of fuel oil delivered by each injection is led through a copper tube to the injection nozzle in the center of the engine

cylinder head. This nozzle is of the spring loaded valve type designed not to lift from its seat until the line pressure is sufficient to insure atomization of the oil. The spraying process consists of first passing the oil through a swirling atomizer, and then through the nozzle sprayer.

All parts of the nozzle are of steel. Careful machining and fitting of the parts is necessary to insure most efficient operation, and for this reason it is desirable to discourage repairs or tampering in the field, hence the policy of having all nozzles in need of repair shipped back to the plant for overhauling at a minimum charge will be pursued. A spare nozzle is supplied with each engine and branches will always have available replacement nozzles so that such a policy will impose no hardship on the engine owner, and will assure operation at maximum efficiency.

All parts of the nozzle are readily taken apart for thorough cleaning, which is the only attention they require. No fine adjustments are necessary and all parts, being of strong construction, little occasion for repair or attention occurs.

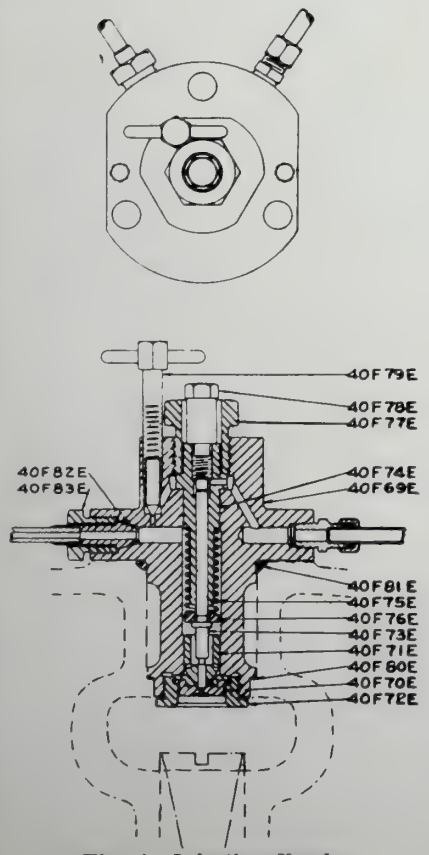


Fig. 4. Injection Nozzle.

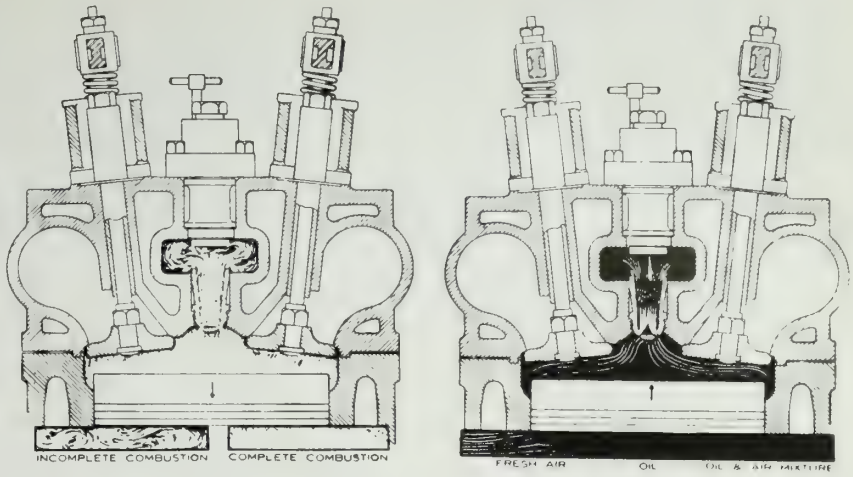


Fig. 3. Pre-Combustion Chamber.

The fuel injection pump is of the plunger type assembled in units and mounted in banks upon a pump base. The pump body is of steel and contains recesses for the pump cylinder, inlet and discharge valves, and by-pass needle valve, all of which are readily removable for cleaning and servicing such as lapping. The pump cylinder, and plunger, which are of steel, can be removed as a unit from the pump body for quick replacement. The plunger is lapped into the cylinder barrel, giving a tight fit without the use of a stuffing box. On each pump is provided an inlet valve lifting screw for throwing out of operation any pump or engine for testing purposes. A pump inlet valve lifting shaft also provides means for stopping the operation of the pumps. This shaft is controlled by a linkage from the control shaft and forms the means for stopping the engine. A hand lever is provided for operating the pump to prime the fuel injection tube and nozzle, and to remove the air from the pump, the tube and the nozzle.

One pump is provided for each engine cylinder, a provision that has the advantage of dividing the responsibility and assuring some power and continued operation in case of damage to any one pump. This is in contrast with the single pump and distributor system, or the constant pressure system, both of which are in use, damage to either of which system stops the engine.

Each pump plunger is operated by a separate cam on the cam shaft through the medium of a roller, rocker arm and tappet. The stroke of the pump is constant for all speeds and loads and the time of injection of oil is also constant for all loads, and dependent upon the contour of the cam, which is accurately formed to give the maximum economy. Since the stroke of each pump plunger is constant and its displacement constant, a needle valve, placed in the discharge side of the pump, and operated by the governor, bypasses a portion of the oil delivered at each stroke, and so meters the charge of oil delivered to the cylinder. This metering of the charge occurs at the instant of injection, consequently the fuel delivered to the cylinder is exactly proportioned to its requirements at that instant, a condition which promotes excellent speed regulation. All of the fuel injection pump needle valves are connected to one link bar, which is controlled by the governor through a linkage. The by-pass needles are all carefully adjusted and set when the engine is tested and the load on all cylinders carefully equalized.

The governor is in the flywheel end of the frame and is mounted on the vertical shaft by which motion is transmitted from the crank shaft to the cam shaft. The governor is of the centrifugal type in which the fly-weight takes the form of a halved octagon. These weights are pivoted to swing radially on arms containing a bell crank for transmitting motion to a link, thence to a sliding sleeve from which a linkage leads to the fuel injection needle valve link bar.

The fly-weights are resisted by radially disposed centripetal springs of the helical type. Adjustment of the springs is provided in the adjusting screw which is of the yoke type. The adjusting nut is carried in a support containing a lock which maintains the adjustment. To adjust the engine speed all that is necessary is to loosen the lock and tighten up or loosen the adjusting nuts with a special wrench which is provided. The standard springs provided with the governor allow for only a slight adjustment of speed, and if an engine speed varying greatly from the standard is desired, different springs must be supplied. The whole arrangement of the springs and adjusting devices is such as to give unrestrained movement and perfect compensation of spring tension which render the governor sensitive and accurate in operation, and the entire construction of the governor together with its location inside of the frame enclosure tends to discourage tampering. The governor is lubricated by the overflow from the upper governor shaft bearing.

Main bearings, crank pin bearings and piston pin bearings are lubricated by means of a pressure feed system; pistons by-splash from the crank throws, and all cams run in oil. Oil is circulated by a gear type pump driven by the lower end of the governor shaft. Oil pressure is kept between ten and fifteen pounds and is regulated by a pressure regulator conveniently located on the outside of the base.

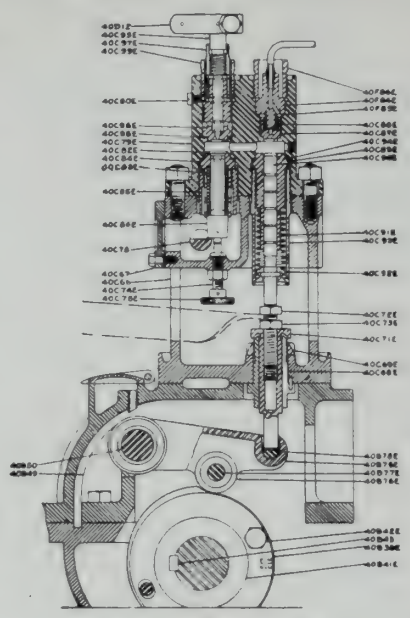


Fig. 5. Injection Pump.

Oil cooler and filter are combined into a single assembly arranged to be placed on the engine room floor close to the engine. The cooler consists of a copper coil placed in a cast iron vessel through which cooling water passes. The coil has cooling surface enough to reduce the temperature of the oil to within 20 degrees of the cooling water. Mounted on the cover of the cooler body is a lubricating oil filter containing a large filter element of fine wire gauze.

The engine is started by means of compressed air from an air bottle which is charged from the engine itself during operation. The bottle is charged to a pressure of about 450 pounds per square inch by opening a charging valve in the head of the cylinder, while the engine is running. The quantity stored is sufficient to start the engine a number of times, so there is no danger of being unable to secure a start. The bottle is charged each time after the engine is started, and the valves are closed tight. In extreme emergency cases carbonic acid gas such as is used at soda fountains can be used for starting. The engines are extremely easy to start, and the quantity of air required is, therefore, very small. No special starting fuel is required, unless the oil being consumed is very heavy and viscous.

All parts of the engine are built by the Chicago Pneumatic Tool Co. which has service branches and agents all over the United States and in many foreign countries. Stocks of parts are carried by those branches and well trained service men are stationed at them, available on short notice.

An unusual conversion feature is incorporated in the design of the engine, in that parts for changing an oil engine into a gas engine are available at moderate cost. Conversion can be made in either direction. This is especially a feature in connection with gas compressor units in which engine and compressor have been combined into an integral unit. The majority of such units have been originally built as gas engine units, but it is believed that conversions into oil engines will ensue.

Florida Is Out of Debt

North Carolina's cost of maintaining and operating state government in 1926 was $5.75; Georgia's was $6.20; South Carolina's was $6.98; Florida's was $7.87 and Virginia's was $8.58. Georgia collected a total of $8.20 per capita, South Carolina $9.38, North Carolina $12.87, Virginia $13.49 and Florida $22.24.

Virginia and Florida decreased their state debts by $913,000 and $183,000 respectively. Alabama, Georgia and North and South Carolina increased their indebtedness by amounts ranging from $605,000 to $28,062,000. Florida, it should be noted, now has no state debt.

There are not very many automobiles in India, but the snakes over there did their best to make up the general average by killing off 19,038 persons last year.

The Division Engineer and Safety

One Man's Big Job

By George H. Warfel

THAT we may have no misunderstanding as to who is meant by the term division engineer, he is here designated as the operating officer of the superintendent's staff responsible for the maintenance of way, track, bridges and buildings, and usually of coal and water stations, and signals. He is generally one of three principal aides to the division superintendent, the other two being the master mechanic and the assistant superintendent or trainmaster in charge of train and station service.

While each of these men has heavy and numerous responsibilities, involving large numbers of persons in many specialized occupations, the division engineer has usually the larger force, scattered in small units all over the property. His problems are further multiplied by the peculiar local conditions of each community and portion of the division. There are geographic, climatic, political, industrial and competitive factors affecting nearly every phase of his work, and he has to consider all these elements more frequently perhaps, than any other division officer.

There is another serious handicap in the track department. That is, the tremendous fluctuations of forces, from the one extreme of winter patrol, to the other extreme of summer activity. And the lack of stability of force entails the further difficulty in a large turnover of labor, men coming and going. Stabilization of force is bound to result in reduction of casualties, and vice versa.

The engineer must be a man of sound judgment, diplomacy and foresight. The layman thinks of him as being a theorist, largely concerned with stresses and strains, measurements and calculations, blue prints and visions. While he must necessarily be competent along those lines, he must in addition be a most practical, resourceful and level headed officer.

The relation of the division engineer to safety is fundamental. Being responsible for the largest third of the division personnel, it would follow that at least a third of the personal injuries might be expected from his department. Furthermore, all the bridges, buildings and permanent structures are under his care, and hazards of fire, flood and property damage affect his record more vitally than is the case with his colleagues. When it is also considered that a large part of the work done by his forces directly involves the safety of train operation, it is apparent that upon him will depend in large measure the safety record of the division, and of the railroad. It is fortunate for that record, that safety is the very essence of his craftsmanship, and is a cardinal principle in the ethics of his profession.

What will he do to improve the safety record of his road? He probably will consider two major problems, reduction of train accidents caused by track and bridge conditions, and reduction of personal injuries to his employes. We shall not attempt to discuss that first major problem, so far as physical conditions enter into it. Volumes have been written about broken rails, which caused 650 derailments, 25 deaths and 397 injuries in 1925. It is comforting to note that the derailments due to bad ties, and others due to spread

—Excerpts from an address at the seventh annual meeting of the safety section, A. A. A., Chicago.

Life, the Chief Asset

By F. B. Thomas

Safety Agent C. B. & Q.

A FRIEND of mine bought a motor car. He believed it would save a lot of time for him.

His business took him about to many places, and he objected much to the wasted minutes going to and fro afoot or on street cars.

The car he bought was a fast traveler. It could pass many others on the road.

The way he felt about railroad grade crossings was something like this:

"I'll never be such an idiot as to take a deadly chance at a crossing, because I read the papers and know right well what has happened to thousands of other drivers."

So far, so good; but he had another fault that finally led to fatal trouble.

He was a fellow so intent upon studying business affairs while driving his car that he would sometimes fall into a brown study, and forget his surroundings.

One day he did this very thing and paid no attention to the fact that he was approaching a railroad crossing.

Maybe because a strong wind was blowing in the direction a train that was coming toward him, he failed to hear the first three blasts of the locomotive whistle; but the fourth blast, continuing way up to the crossing, startled him into immediate action.

He shut off the power, and jammed on the brake, but could not prevent skidding against the second car in the train.

His trusty car was sent spinning and whirling, and finally landed fifty feet away—just a mass of wreckage.

The driver must have been killed instantly, because he was found with his skull crushed and neck broken.

The records of the Interstate Commerce Commission show that on one of the important railroads, last year, automobiles drove into engines or cars in exactly 27 per cent of the grade crossing accidents that occurred.

Always THINK of trains when approaching railroad crossings.

Use eyes and ears.

Train the mind to mind the train.

track, resulted in scarcely any casualties, because these were nearly all on side tracks. But the 21 accidents with four killed and 83 injured caused by failure of maintenance of way employes to protect properly when obstructing track, are decidedly for our consideration. We are most keenly interested in the human factor of that first problem.

The division engineer will do much, of his own initiative, but he will do very much more if his superintendent is as vigorous and aggressive in safety work as he should be. On a railroad, inspiration, like criticism, should properly come from above down through the organization, and this is especially true of accident prevention. The standing of a railroad in the I. C. C. accident tabulations, is a fairly reliable index of the energy of its management in accident prevention.

If our division engineer is properly inspired, he will be one of the strictest disciplinarians on the road. His trackmen must never fail to find the washout before the train finds it. His bridge men must never make superficial inspections. His flagmen must be letter perfect in the rules. They must all be so frequently and critically checked, that their performance is automatic. He won't merely believe they will do it, he will know they are doing it! And the least deviation discovered must be followed by summary discipline, advertised all over his division. His immediate subordinates, the supervisors and roadmasters, must be shown that reluctance or indifference in matters of discipline, on their part, will subject them to the same sort of treatment. This attitude does not necessitate anger, coldness nor ill temper on the part of the officer, merely aggressive insistence upon literal rule observance. That is the most reliable preventive for train accidents caused by man failures that has ever been devised. Cordial and friendly relations with employes is a most desirable condition, but it should not exist at the expense of discipline.

On the Osage River Near Henley, Mo., on the Chicago, Rock Island & Pacific.

When I mention rules I refer to all rules, special bulletins and circulars, and even oral instructions. Most modern roads have special rule books for various departments, — transportation, maintenance of way, mechanical. If such books have been carefully prepared they are very comprehensive, but experience makes necessary a further issue of circulars and bulletins. It is essential for uniformity in practice, for safety, and for discipline, that there be an established rule covering practically every action required or circumstance encountered.

There are two ways of determining the occasion for discipline. The long established custom has been to administer punishment after the accident, graduated according to the seriousness of the actual result. The more effective method, from the standpoint of accident prevention, is to administer the discipline before the accident—graduated according to the gravity of the hazard incurred by improper performance.

Our thoughtful engineer immediately perceives that he is handicapped in his constructive effort along this line, because his men are so scattered and isolated. It is rather easy for the mechanical or transportation supervisor to test and check the performance of his men, when they do not realize they are under observation. That is the very best evidence of the effectiveness of instructions—performance when apparently unobserved.

But the difficulty in the maintenance of way department may be partly overcome by vigorous schooling of the supervisor, roadmaster, general foreman and others, to use every opportunity to make surprise checks on performance of the employes. Discipline should be vigorous for infractions of rules or instructions discovered because, manifestly, discovery is difficult, and would indicate an all too prevalent condition.

By far the greatest opportunity for the division engineer to improve safety performance lies in reduction of fatalities and serious injuries to his employes. As this meeting is of national scope, let us consider the problem of the national division engineer as illustrated by I. C. C. Bulletin No. 94 reflecting conditions for 1925, the last figures available.

In that year this national division engineer's men worked over

972 million hours, more than one-fifth of all the hours worked on the nation's railroads, including the time of presidents, clerks and office boys. In other words, he averaged 400,000 men on the job for eight hours, each regular working day, except two, (I think those were two days when the world series ball games were being played).

Over half those hours were worked by section laborers. Their fatal injury rate, while on duty, was 0.43. The average for all employes was 0.33. What a great field for improvement, and there are more of the section hands than of any other class of men on the railroads of the country. But the track formen's fatality rate, 0.44, is worse than the laborers. That difference might be hard for some to explain, but I am sure my opinion is the correct one. The track foreman is like the captain of a boat. He won't leave the motor car, or the track, till everyone else is off!

These track men give cause for serious concern, but there is another group of the division engineer's men, not nearly so large, whose fatality and serious injury rates are entirely too high, the B. & B. carpenters. Compare their fatality rate of 0.57 with the average of 0.33. And look at their serious injury rate of 43.28 when the average is 25.77. No wonder it has been proposed to stretch nets under a bridge or building where they are working, as the circus does for its trapeze performers!

But not all of them are hurt by falling. I have heard of one who had let a bridge deck down on new stringers, but it lacked a couple of inches of resting flat, because one stringer was not quite in place. So he stood on a stringer, with one foot under the ties of the deck, and with a bar he pried the other stringer into place, letting the whole bridge drop on his toe! Just like sawing off the limb you are sitting on! Now that is no laughing matter to the man with the toe, nor to the man whose safety record reflects his ability to prevent accidents. Such a case as that cannot be remedied with rules or blue prints, Mr. Engineer!

If more evidence be desired to establish the size of the division engineer's safety problem, look at the fatality rate for linemen on duty, 0.75, and signalmen and maintainers, 1.10, remembering our average rate of 0.33. The linemen's injury rate of 38.25 is about one and a half times the average, too. Those signalmen have a peculiar trait according to the figures. No half way measures for them. They either "go west," or go on working, apparently, for with a fatality rate over three times the average, the rate of serious injuries is only two-thirds as high as the average.

Now let us lend our friend what wits or sympathy we can muster, as he ponders the age old question, "What to do,—what to do?"

First off, the superintendent must back him up, when he insists upon the management providing first class tools, tools proved by field test and laboratory analysis to be the best. But even the best tools get worn and dull, and we must have good repair shops, manned by men who know the service these tools must stand, and how properly to condition them. It is foolish to let a four-dollar imitation blacksmith ruin 50 modern track chisels which cost $75 in one day, by not knowing how to handle heat treated steel.

But every self-respecting division engineer knows that good equipment, good facilities and good housekeeping are primary requisites in reducing accidents. Every live manager knows that, too. So the management "comes across," and then says to the division engineer, "Now we have laid down good rules, we have furnished good tools, good storage facilities, good material yards, and we've gone further than that, we've furnished a good safety agent. We've bought and paid for this safety. Now let's see some of it."

Soon the accidents caused by

—Wide World Photos.

Steamship Beljeane at Eddystone Wharf of the Baldwin Locomotive Co., Loading 44 Locomotives for Rio de Janeiro.

poor equipment become fewer, and the rule violations are less, but there continue to be a lot of accidents that indicate that the man in the field gets hurt apparently from his own indifference. He's like the mule whose sight was in question, because he kept bumping into things. The darky who sold him insisted, "No, that mule ain't blind, he just don't give a damn!" Some men appear to be like that!

So our division engineer analyzes the situation this way:—"These section laborers, and foremen, and bridge carpenters, and signal men are scattered all along the hundreds of miles of line. They don't often get into safety meetings. I can't afford to bunch them up every month as the master mechanic does his men, or the trainmaster does his. How can I get at them? I can get a new, modern, copying machine, and mail thousands of circulars and letters out to them every week or so, telling them what has happened elsewhere, what new methods are being tried, and perhaps get a little enthusiasm stirred up. But by that method I don't get any information from them. They don't take any part in helping solve our accident prevention troubles. And lots of them just feel that these letters are for the other fellow. I don't get the personal contact.

"Well, there's another way I can reach them, if I must. But, gosh, I'd hate to start that. I could divide this division into two or three parts, and make a trip over one part each month on the big motor car with the safety agent, and hold a half hour safety meeting with each gang and not only talk to them, but make them talk, too. I could have the linemen and maintainers join the nearest section or bridge gang, or have a special meeting where a few of them are working together. That method would reach the most isolated, the most numerous, and most hazardous classes in my force. But even then we can only talk to them once in two or three months, and there's so much to tell 'em, we couldn't say half of it in half an hour. The circulars would do that better. I'll have to study this over."

So he confides his thoughts to the safety agent. That fellow is a live wire, and says, "I hate all day motor car rides as bad as you do. It would take a three to five-day trip every month, maybe a week, to do it right. But it is one sure way to get that personal contact. Copy and mail the circulars and letters, too. Then we don't have so much to repeat over and over. But why let the superintendent sit in his office or private car while we preach safety? I'm going to tell the general manager that if he'll make the superintendent go, too, with the bridge supervisor, and the roadmaster and us, we will just organize this gospel team and convert the whole force."

If the general manager knows his onions, he will say, "Sure, a three or four or five-day motor trip every month will do each superintendent as much good as it will the safety work. He will see more and know more, of the work and of the men. Good idea! We'll do it!" Of course, the superintendent won't be very enthusiastic. The small boy isn't very enthusiastic about castor oil either. But in both cases it is good for them.

Coast Rail Rates Prescribed

In adjusting the Northern and Southern Pacific Coast rail rates, the Interstate Commerce Commission has made definite findings for charges on classified freight.

Schedules laid down for class rates between San Francisco and Portland, Ore., fixed a charge of 80 cents per 100 pounds for first-class freight; 64.5 cents for second, third and fourth-class shipments and 44 cents for fifth-class shipments.

The railroads were ordered to adhere strictly to the scale.

As to traffic moving on commodity freight rates, however, which includes a variety of material such as canned goods, vegetable oils, machinery, iron and steel, sugar, beverages, metals and building materials, the railroads were given considerable discretion. They were authorized to fix rates on these commodities moving north or south at a point "not less than 10 cents per 100 pounds higher than rates contemporaneously maintained on like traffic by standard steamer lines operating between the said ports."

The 10-cent limitation further was limited by the ruling that no rates from San Francisco to Portland lower than 82 cents per 100 pounds should be fixed by railroads and no rates between Los Angeles and Portland lower than 50 cents.

Between San Francisco and Seattle a minimum commodity rate of 43 cents was prescribed and between Los Angeles and Seattle the minimum is 61 cents, the same provision specifying that railroads also must keep Seattle rates at least 10 cents above steamer rates to the same points.

A Young Inventor Wins

The John Scott medal, given annually in recognition of "inventions for the use and benefit of mankind," has been awarded to D. D. Knowles, 28-year-old inventor of the Grid Glow Relay. Notice of the award, which carries a cash prize of $1,000 was given by Walter R. Russel, acting secretary. Presentation will be made at later date.

Mr. Knowles perfected his invention in the research laboratories of the Westinghouse Electric & Manufacturing Co. His grid glow relay has been acclaimed the most sensitive current-controlling device ever developed. The glow tube, which functions on a billionth of a watt, is set in operation by such tiny impulses as the mere approach of the human hand, a drop of water or the light of a match.

The fund for the award was established in 1816 by John Scott of Philadelphia. Five other scientists were similarly awarded this year.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

SPECIAL reports received from Class I railroads indicate that a total of $1,559,000,000 was expended by them in 1926 in the direct purchase of fuel materials, and supplies. This amount was 12.0 per cent greater than in 1925, and 16.1 per cent greater than in 1924, but 10.4 per cent less than in 1923. The annual average during the four year period from 1923 to 1926 was one billion 508 million dollars.

New Haven Proposes Bus Terminal

The New Haven railroad has proposed to the city council of Providence, R. I. a plan for the construction of a bus terminal behind the union station. The terminal would be used only by the buses of the New England Transportation Co., the United Electric Railways, Interstate Limited Motor Coach Co., Newport Electric Corpn., Interstate Buses Corpn. and "quite likely" another line operating between Boston and Providence. A clause in the plan provides that companies in the combination be protected against competition in the center of the city by creating an area in which all highway motor stops, excepting those of the United Electric Rys., which operates both local railway and bus lines, shall be forbidden.

Southern Buys More Rails

The Southern Railway has purchased 38,325 tons of new rails for delivery in 1927. This brings the total purchase of this road for the year up to 85,000 tons or enough to lay nearly 542 miles of track. Most of the rail ordered is 100 lbs. in weight.

Building Operations Heavy

The national construction survey just completed by the American Construction Council shows that while for the country as a whole construction activities for the first six months of 1927 may be slightly less than for the first six months of 1926, a very high volume is still being maintained. The present prospects are encouraging for a well sustained season in building operations, with a large volume of engineering construction underway and projected.

Receiver for Indiana Road

Federal Judge T. W. Slick has appointed R. R. Smith, vice-president and general manager of the Chicago, South Bend & Northern Indiana Ry., South Bend, Ind., receiver of the company. The line operates between Michigan City and Goshen, and maintains city service in South Bend, Laporte, Michigan City, Mishawaka, Elkhart and Goshen. More than 120 miles of line is involved.

Chicago Railways Bond Interest

The Chicago Railways, operating the north and west side street car lines, recently announced they would make application to the federal court for authority to pay the semi annual interest due in August on all classes of bonds, except the income bonds which are payable next May if earned. The principal of the bonds is in default. Traffic on the lines is running heavier every month, and total revenue is showing a favorable increase. The Chicago City Railway announced last month it would pay its semi annual interest due in August.

C & O Increases Miles Per Car Per Day

A daily average of 56.6 miles per car per day was the record made by the Chesapeake & Ohio during June, according to an announcement by President Harahan. This represents an increase of one-tenth of a mile over the May record, which was 56.5, and is close to the February record of 56.8. The excellence of this record stands out when compared with the daily car mileage for Class 1 railroads as a whole. The latest month for which these figures are available is May, and the average daily movement per car in May was 30.2, the highest ever attained that month since compilation of these reports began in 1917. This was an increase of two-fifths of a mile above that for May of last year, and an increase of 2.8 miles above the average for May, 1925. This speeding up in the movement of cars per day is one of the most outstanding evidences of the increased efficiency which steadily is marking the operation of the railroads today.

S. P. to Abandon Branch Line

The Southern Pacific has asked the I. C. C. for permission to abandon the 28-mile Airline branch line in Polk county, Ore., as this territory is served adequately by other parts of the Southern Pacific system; and 20 miles of line between Weed and Grass Valley in California, as a cutoff has been constructed between these two points. The company has also asked the state railroad commission for permission to abandon the steam lines of the Santa Paula and Ojai branches in Ventura county in favor of a motor bus line operated by its new subsidiary, the Southern Pacific Motor Transit Co. The bus company, according to the request, wants to operate between Oxnard and Saugus via Santa Paula and between Ventura and Santa Paula via Ojai.

Bus Franchise Requested in Louisville

The Louisville Railway, Louisville, Ky. has applied for a franchise to operate a bus service in conjunction with its street car lines. They requested 10 cent fare, with free transfers on buses, and a 7 cent railway fare, with a 3 cent charge for a transfer to a bus.

Danville to Increase Bus Service

The Danville Street Railway & Light Co. has asked the Illinois commerce commission for permission to install buses on the Danville Junction line to replace electric cars. The Junction line was built by the late Uncle Joe Cannon and his brother, William P. Cannon, in 1882.

Colombian Government to Build New Roads

Large orders for steel rails and railroad equipment in this country are foreseen in the plan of the Colombian government to spend $25,000,000 for new railroads, construction of which will be undertaken immediately, according to a statement made by Hallgarten & Co., investment bankers. Colombian railroad development is expected to stimulate similar projects in other South American countries, creating outlets for both United States capital and manufactures.

Minority Bond Holders Appeal Denied

The United States circuit court of appeals on July 22 denied the appeal of the Jameson committee of junior bond holders of the Chicago, Milwaukee & St. Paul, from the approval of Judge Wilkerson to the reorganization plan. The Jameson committee represented 70 persons who held $16,000,000 worth of the refunding bonds. They refused previously to deposit their bonds in exchange for securities of the new rail-

road company under the reorganization plan. Hearings were held in Washington during July by the I. C. C. on the reorganization plans.

Binghamton Wants Buses

The Binghamton Railway, Binghamton, N. Y., has petitioned the public service commission for permission to abandon its lines known as the Rockbottom line and the Spring Forest line. At the same time the Binghamton Railway Bus Lines, Inc., has asked for a certificate for the operation of bus lines on the routes of the railway to be abandoned.

S. P. Authorized to Issue Equipment Trust

On July 25 the I. C. C. authorized the Southern Pacific Co. to issue equipment trust certificates to the amount of $5,786,000. According to the authorization the company is to pay 35 per cent of the cost of the equipment in cash bringing the total to be spent up to close to $9,000,000.

Electric Line to Suspend Operations

The Pennsylvania & Maryland Street Ry., Elk Lick, Pa., recently acquired by the Penn Public Service Corpn., has applied to the public service commission for permission to abandon the line between Meyersdale and Salisbury. A bus line has been established between Cumberland, Md., and Meyersdale. As soon as the railway is abandoned the bus line operating between Johnstown, Somerset and Meyersdale will be extended to the Maryland state line, where connection will be made with through buses between Uniontown and Cumberland, Md., and points east and west.

Panama Canal Traffic

Two hundred and forty-nine commercial vessels passed through the Panama Canal in the first two weeks of July, paying tolls of $1,057,944 Gov. Walker announced. During the first six and a half months of this calender year a total of 3027 vessels passed through the canal.

San Francisco Again to Vote on Bonds

Although the voters of San Francisco defeated a $4,000,000 bond issue for proposed extensions to the municipal railway system less than a month ago, the board of supervisors has taken steps to have another vote on the matter in November. A resolution providing for the resubmission of the question was introduced by Supervisor Shannon and adopted. The explanation given for the move was that "the conditions" at the recent bond election were such that a "real reflection of public desire" was not obained.

Northern Pacific to Abandon Branch

Permission to abandon 25 miles of the Bitter Root branch between Florence and Hamilton, Mont., was given the Northern Pacific by the I. C. C. The railroad will build an equal amount of new track on the east side of the Bitter Root River.

Franchise of Surface Lines Extended

On July 13 an ordinance was passed by the city council of Chicago extending for four months the franchise of the Chicago Surface Lines. The extension was granted to allow time to work out a permanent settlement of the Chicago transportation problem.

Railway Construction

Tracks and Yards

CALIFORNIA.—The Madera Sugar Pine Co., has awarded a contract to A. J. and J. L. Fairbanks, South San Francisco, for a logging railroad in Mariposa county, 20 miles long.

CANADA.—The Canadian Pacific has awarded a contract to the Dominion Construction Co., for a nine-mile double track line diversion, from Esher to Healy. Esher is nine miles west of Chapleau, Ont., on the Algoma district. Other contracts have been awarded to W. P. Dutton & Co., Winnipeg, for a branch line between Foam Lake, Sask., and Duval, 75 miles; to Dutton & Mannix, Winnipeg, for grading a line extension from Rosetown, Sask., to Perdue, 31 miles; to Duff, Flint & Co., Winnipeg, for pile trestle work on the Rosetown-Perdue extension and the extensions from Maxstone, Sask., west 30 miles, and from Asquith, Sask., northwest 20 miles.

—The Canadian National has awarded a contract to the Tomlinson Construction Co., Winnipeg, for a line between a point near Sturgis, Sask., and Hudson Bay Junction, with a branch from a point on this line to a point between Crooked River, Sask., and Mistatim, about 132 miles. Grading and the construction of culverts and station buildings will be done by the contractor. Ballasting, rail laying and bridge construction will be completed by company forces. Other contracts have been awarded to the Campbell Construction Co., Winnipeg, for clearing the right of way, grading and construction of culverts for a belt line at Saskatoon, 7 miles; to Hett & Sibbald, Ltd., and Bryson Brothers, Prince Albert, for clearing the right of way, grading and construction of culverts for a line between Weyburn and Radville, 27 miles; to the Campbell Construction Co., Calgary, for grading and culverts for a line from Shell Brook, Sask., west to a point west of Shell Lake, 77 miles; to Dutton & Mannix, Winnipeg, for a line from a point near Spruce Lake, Sask., through Le Claire, to the North Saskatchewan River, 30 miles, at an approximate cost of $900,000; to Stewart & Campbell, Ltd., Winnipeg, for grading and culverts for a line from Elk Point, Alta., east to the North Saskatchewan River, 19 miles, to cost $745,000; to Stewart & Campbell for grading and culverts for a line from a point east of Ashmont, Alta., east to Bonnyville, 38 miles, to cost $1,415,000. Tenders are now being invited for 7.9 miles of new line between Grand Mere, Shawinigan Falls and East Burrills, in the province of Quebec. Bids for clearing the right of way, grading and construction of culverts on the Sturgis-Peesane branch, 79 miles, and the Willowbrook Northwesterly branch, 22 miles in Sask., and on the Bretona-Cloverbar cut-off, 11 miles, in Alberta, closed July 21.

—The Dominion government has given an order in council authorizing the expenditure of $1,569,887 for the development of railway terminal facilities at Vancouver. The expenditure includes the purchase of right of way at a cost of $779,000, extension of the line from St. George's avenue to Lynn creek and a storage yard at North Vancouver at a cost of $163,800, and a subway under Lonsdale avenue at a cost of $261,500.

INDIANA.—The Big Four has awarded a contract to the Walsh Construction Co., Davenport, for grading and masonry work in connection with the enlargement of the yards at South Anderson.

—The Pennsylvania has awarded a contract to the Mellon Construction Co., Pittsburgh, for grading and track work for the west approach of the new Wabash River bridge at Terra Haute, to cost $100,000.

MISSISSIPPI.—The North division of the Gulf & Ship Island has applied to the I. C. C. for authority to construct a 150-mile line extending from a connection with the main line of the G. & S. I. at Mendenhall, in a northerly direction through Kosciusko, Zama, Carthage, Canton, and Pelahatachie, through a part of Simpson, Smith, Scott, Leake, Attalla, Madison and Rankin counties, to serve a lumber traffic.

NEBRASKA.—The Union Pacific has made preliminary surveys for a line between Gering and some point on the main line between Cheyenne and Julesburg.

OHIO.—The Toledo & Cincinnati has applied to the I. C. C. for authority to construct an extension of 4.3 miles from Hamilton Furnace in Butler county.

OKLAHOMA.—The Tulsa, Wewoka & Southern has applied to the I. C. C. for authority to construct a line between Tulsa and Ardmore, passing through or near Okemah, Wemoka and Ada, approximately 220 miles.

OREGON.—The Oregon Trunk has awarded a contract to Hauser Brothers Construction Co., Portland, for a line from a point 25 miles south of Bend to Chemult, 45 miles, to cost about $1,750,000. The new line will connect the Shevlin Hixon Railway, a lumber road recently acquired by the Oregon Trunk, with the Cascade line of the Southern Pacific at Chemult.

PENNSYLVANIA.—The Pennsylvania has awarded a contract to W. F. Trumble & Sons Co., Pittsburgh, for grading work at Sewickley, estimated to cost $100,000.

SOUTH DAKOTA.—The Mound City & Eastern has applied to the I. C. C. for authority to build a new line from Mound City to Leola, approximately 70 miles.

TEXAS.—The Panhandle & Santa Fe has been authorized to construct a line from White Deer in Carson county to a point in Hutchinson county, 21 miles. The estimated cost, including 27 miles of sidings, is $1,954,300.

—The San Benito & Rio Grande Valley has awarded a contract to the W. T. Montgomery Co., San Antonio for a line from Fernando eastward to the Gulf of Mexico, six miles. Another contract has been awarded to the W. H. Nichols Co., Dallas, for a line from San Benito eastward 18 miles to Laguna Vista.

—The Santa Fe has awarded a contract to the Griffith Construction Co., Fort Worth, to enlarge the yards at San Angelo which will approximately double their capacity.

—The Waco, Beaumont, Trinity & Sabine has been authorized to build an extension from Weldon to Waco, 109.3 miles, an extension from Livingstone by way of Beaumont to Port Arthur, about 100 miles, and a belt line through the southern and southwestern parts of Beaumont, the line south of Beaumont to be built only in the event the company is unable to effect arrangements on terms satisfactory to it for the use of existing rail and terminal facilities in the Beaumont-Port Arthur district and at Port Arthur.

VIRGINIA.—The Virginian Railway has awarded a contract to the Walton Sudduth Co., Bluefield, W. Va., for a subgrade for the extension of eight passing tracks between Roanoke and Princeton, W. Va., to cost $35,000.

WEST VIRGINIA.—See item about the Virginian Railway under Virginia.

Buildings and Structures

ARKANSAS.—Hulbert. The Rock Island has awarded a contract to the F. W. Miller Heating Co., Chicago, for a boiler washing plant.

CANADA.—Camrose, Alta. The Canadian National closed the bids for a 100-ton mechanical coaling station July 15.

—Cheakamus, B. C. The Pacific Great Eastern is receiving bids for reinforced concrete bridges at three points on the Squamish subdivision between Cheakamus and Watson.

—Fernie, B. C. The Morrissey, Fernie & Michel plans the reconstruction of its shops, which were destroyed by fire on July 3.

—Winnipeg, Man. The Canadian Pacific has awarded a contract to the J. McDiarmid Co., Winnipeg, for an immigration hall, to cost about $60,000.

—Fort William, Ont. The Canadian Pacific has closed the bids for the dismantling of wood grain elevators "A" and "B," preparatory to improvement of the port facilities at that point.

—Port McNicoll, Ontario. The Canadian Pacific has awarded a contract for a 2,000,000-bu. addition to the grain elevator, including necessary working house facilities.

—Moose Jaw, Sask. The Canadian National closed the bids for a 100-ton mechanical coaling station July 15.

—Willow Bunch, Sask. The Canadian National closed the bids for a combined passenger and freight station July 15.

Florida.—Olympia. The Florida East Coast is contributingto the cost of two overhead bridges, now being constructed by the state highway department at Vero Beach and Olympia.

Georgia.—Nashville. The Atlantic Coast Line is said to be planning to build a 125-ton steel bridge.

ILLINOIS.—Chicago. The Chicago & North Western has awarded a contract to S. G. Cool, Chicago, for a boiler house at the Chicago avenue terminal, to cost about $30,000. An agreement has been reached between this company and the committee on track elevation of the Chicago city council for three highway subways under the tracks at Peterson and Rogers avenues. The estimated cost is $375,000, about $108,000 of which will be paid by the city.

—Quincy. The Burlington has awarded a contract to the Roberts & Schaefer Co., Chicago, for a one-track cinder plant.

—Silvis. The Rock Island has awarded a contract to the T. S. Leake Construction Co., Chicago, for locomotive repair shop facilities, including a one-story machine shop addition, to cost about $125,000.

INDIANA.—Lovett. The Baltimore & Ohio is said to be planning a 335-ton bridge.

—Olivers. The New York Central has awarded contracts to the Ogle Construction Co., Chicago, for a 50-ton, one track, electric steel coaling station, and a one-track, electric cinder plant

—South Anderson. The Big Four is receiving bids for an enginehouse and terminal buildings to cost about $200,000. This company has awarded a contract to the Hecker-Moon Co., Cleveland for the separation of grades at Main street.

—Terre Haute. The Pennsylvania has awarded a contract to the Dravo Contracting Co., Pittsburgh, for a double track concrete trestle at the west approach to the new Wabash River bridge to cost $75,000.

IOWA.—Iowa Falls. The Rock Island has awarded a contract to the Howlett Construction Co., Moline, for a frame mechanical coaling station.

KANSAS.—Cherokee. The St. Louis-San Francisco has awarded a contract to the Ogle Construction Co., for a 200-ton, two-track, electric, reinforced concrete coaling station.

—Kansas City. The Rock Island has awarded a contract to Joseph E. Nelson & Sons, Chicago, for a water treating plant.

—Mineola. The Rock Island has awarded a contract to the Howlett Construction Co., Moline, for a frame mechanical coaling station.

—Ottawa Junction. The city of Ottawa has prepared tentative plans for a grade crossing elimination project to carry a highway across the tracks of the Santa Fe, one half the cost to be borne by the railway company.

LOUISIANA.—New Orleans. The Southern Pacific has awarded a contract to the G. E. and E. E. Reiman Co., New Orleans, for a two-story reinforced concrete, brick and steel fruit warehouse on Front street. The structure, which will include an office build-

ing attached to the warehouse, will cost about $100,000.

MAINE.—Presque Isle. The Bangor & Aroostook, it is said, will construct a 375-ton bridge.

MARYLAND.—Forest Glen. The Baltimore & Ohio has awarded a contract to Frainie Brothers & Haighley, Baltimore, for a passenger subway, to cost about $21,000.

MASSACHUSETTS.—Worcester. The Boston & Albany has awarded a contract to the J. F. Fitzgerald Construction Co., Boston, for a boiler house.

MISSOURI.—Brookfield. The Burlington has awarded a contract to the Robberts & Schaefer Co., Chicago, for a 2-track cinder handling plant.

—Kansas City. The Kansas City Terminal has awarded a contract to the List & Weatherly Construction Co., for the Van Brunt boulevard subway under eight tracks of the company, to cost approximately $290,000.

—Hermann. The Missouri Pacific has awarded a contract to the Foundation Co., of Missouri, Kansas City, for a water station and water treating plant.

MONTANA.—Glendive. The Northern Pacific will rebuild 14 stalls of the enginehouse. The new stalls will be of brick, timber and concrete, and will cost about $140,000.

NEW JERSEY.—Jersey City. The Pennsylvania has awarded a contract to A. N. Spooner & Son, Inc., New York, for reconstructing Pier K. Estimated cost, $600,000.

The Central of New Jersey has awarded a contract to the Bethlehem Steel Co., for a bridge to be erected at West Side avenue.

The Erie has awarded a contract to George W. Rogers & Co., New York, for paving, curbing and drainage at its Monmouth street yards, in connection with its extension of team tracks.

—Newark. The Lehigh Valley and Pennsylvania has awarded a contract to the Arthur McMullen Co., New York, for four main piers on pneumatic caisson foundations for the bridge across the Newark bay. The approximate cost of the work covered by this contract is $1,000,000. The New Jersey board of public utility commissioners has ordered the elimination of the grade crossings of two of the Lehigh Valley's three tracks at Freylinghuysen avenue. The Pennsylvania, which has two tracks across this street at this point, will participate in the necessary work, estimated to cost $514,867.

—Weehawken. The New York Central has postponed indefinitely the awarding of the contract for new ferry bridges, as changes are being made in the plans of the company for development at this point.

NEW YORK.—Albany. The New York Central has awarded a contract to the Campion Construction Co., Albany, for paving work in the freight yard.

—Buffalo. The New York Central has awarded a contract to the Walsh Construction Co., for a baggage sub station, passenger station and garage, to cost around $3,000,000. A contract for passenger yard drainage has been awarded to the John Johnson Construction Co.

The Erie has awarded a contract to the Newhall Construction Co., Cleveland, for a stock-feeding station, to cost about $100,000.

—Cobleskill. The Delaware & Hudson has been ordered by the New York state public service commission to eliminate three grade crossings, by closing and diverting traffic to a new highway, at an estimated cost of $55,900.

—Hartsdale. The New York Central has awarded a contract to E. J. Doyle, New York, for a station plaza.

—Kingsbridge. The New York Central has awarded a contract to the General Electric Co., New York, for switchboards and appurtenances at Kingsbridge, Spuyten Duyvil, Mt. St. Vincent, Yonkers Yard and Greystone.

—Mayville. The Pennsylvania has awarded a contract to the Beatty Engineering & Construction Co., Hamburg, for an overhead bridge to cost $66,000.

—New York. The Pennsylvania has awarded a contract to Allen N. Spooner & Co., Inc., New York, for repairs to pier No. 27 in the North River, to cost $40,000.

The New York Central has awarded a contract to James Stewart & Co., for a 35-story office building to bridge Park avenue between 45th and 46th streets. The building was designed by Warren & Wetmore, architects, and will cost $9,000,000. The structure is linked up directly with the plan to eliminate the bottleneck traffic situation at the north end of the Grand Central Terminal by the opening of Depew Place. A separate contract was awarded the same company for a roadway running through the building. A contract for the filling for main line tracks, north approach to Dyckman street bridge, has been awarded to the Lyons-Slattery Co. Inc., New York.

—Phillips Manor. The New York Central has postponed indefinitely the awarding of the contract for a substation, as changes are being made in the plans of the railroad for development at this point.

—Port Morris. The New York Central has awarded a contract to the General Electric Co., New York; for two turbine exciters with switching equipment at power station.

—West Albany. The New York Central has awarded a contract to H. R. Beebe, Inc., Utica, for alterations and additions to an inspection yard shed.

NORTH DAKOTA.—Mandan. The Northern Pacific it is said, plans to build a one-story brick and concrete power plant, with a coal trestle and concrete stack, to cost about $140,000.

OHIO.—Akron. The Erie and Pennsylvania, it is said, have made plans for the elimination of grade crossings.

—Barnesville. The Baltimore & Ohio, it is reported, expects to ask for bids on a bridge.

—Cincinnati. The Baltimore & Ohio has awarded contracts to Sheesley & Janney, Johnstown, Pa., and to the Vang Construction Co., Cumberland, for work on the elimination of a grade crossing on Paddock road, to cost $165,000. Other contracts have been awarded to the Pittsburgh-Des Moines Steel Co., Pittsburgh, for water stations and treating plants at Ravenna and Kent, to cost $7,000, and to J. M. Caen, Baltimore, for water stations and treating plants at Greenwich and Lodi, to cost $17,000.

The Big Four has awarded a contract to the Blaw-Knox Co., Blawnox, for a steel shop building. The contract for the foundation of this building was awarded to the Kuert Construction Co., Indianapolis.

The Chesapeake & Ohio has awarded a contract to the U. G. I. Contracting Co., for the sub-structure of a new railroad bridge across the Ohio River. This work is to cost $500,000 and includes the installation of several large piers in the Ohio River under 40 to 50 feet of water.

—Cleveland. The Nickle Plate has announced plans for a freight terminal, to cost about $10,000,000 following a decision in the United States district court at Cleveland, upholding the right of the road to condemn land to be used as a site for the project.

The Pennsylvania has awarded a contract to J. G. Kenan Co., Cleveland, for a bridge to carry its tracks over the Nickel Plate near 79th street, to cost about $180,000.

—Cuyahoga Falls. The Baltimore & Ohio has awarded a contract to the Pittsburgh-Des Moines Steel Co., Pittsburgh, for water treating plants at Cuyahoga Falls, Akron Junction and Warwick, to cost $42,000.

—Kent. The Baltimore & Ohio has awarded a contract to the Bates & Rogers Co., Chicago, for a bridge, to cost about $15,000.

—Portsmouth. The Norfolk & Western is said to be considering the erection of a 1,000-ton steel crane runway.

—Rootstown. The Pennsylvania has awarded a contract to the T. J. Foley Co., Pittsburgh, for an overhead high-

way bridge to eliminate a grade crossing, to cost about $50,000.

PENNSYLVANIA.—Beaver Falls. The Pennsylvania has awarded a contract to the Allegheny Paving Co., Pittsburgh, for paving Seventh avenue and Bridge street.

—Bethlehem. The Central of New Jersey, it is said, plans to build a boiler shop, machine and forge shop.

The Lehigh Valley, it is said, plans to build a 200-ton steel bridge.

—Cresson. The Pennsylvania has awarded a contract to the Milliron Construction Co., Du Bois, for a bridge to eliminate a grade crossing of the William Penn highway.

—Glenwood. The Baltimore & Ohio has awarded a contract to Milo P. Hanke, Cincinnati, for water facilities, to cost about $26,000.

—Home. The Buffalo, Rochester & Pittsburgh has awarded a contract to the Miller Construction Co., Punxsutawney, for two concrete bridge abutments for an overhead highway bridge to eliminate a grade crossing, estimated to cost $25,000.

—Lancaster. The Pennsylvania has prepared plans for a new passenger station and is inquiring for 425 tons of steel for use in the structure.

—Lansing. The Reading is said to be planning a new freight and passenger terminal.

—Millvale. The Pennsylvania has awarded a contract to M. J. McMenamin, Philadelphia, for a bridge over Girty's run, to cost $30,000.

—Mountain Top. The Lehigh Valley is said to be planning to build a 120-ton bridge.

—North Philadelphia. The Reading has prepared extensive plans for a $2,000,000 passenger station at Broad and Huntington streets, replacing the present north and southbound stations at Huntington street. The station is to be of Indiana limestone, 180 ft. in length and 80 ft. in depth.

—Philadelphia. The Pennsylvania has awarded a contract to Edward H. Reuss, Jr., Philadelphia, for two 84-in. boilers in its new office building at 32nd street and Lancaster avenue. This company plans to build a 350-ton steel bridge.

—Pittsburgh. The Pennsylvania is said to be planning a 150-ton steel bridge.

—Shermansville. The Bessemer & Lake Erie have received bids for a reinforced concrete overhead highway bridge, to cost about $118,564.

TENNESSEE.—Yale. The St. Louis-San Francisco has awarded a contract to the Roberts & Schaefer Co., Chicago, for a 400-ton reinforced concrete automatic electric coaling plant.

TEXAS.—Amarillo. The Panhandle & Santa Fe has awarded a contract to W. G. Windsor, Amarillo, for a one-story warehouse and storage room, to cost about $65,000.

—Cleburne. The Santa Fe has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for shop buildings, involving the use of about 2,800 tons of steel.

—Edinburgh. The Southern Pacific has awarded the following contracts for structures on the recently completed Rio Grande Valley extension: to the Ware Co., El Paso, for a passenger station, at Edinburgh to cost $40,000, and for combined passenger and freight stations at Elsa, Azahar, La Villa, Santa Rosa and Sauza and two section house layouts at Elsa, at a total cost of about $60,000; to R. W. Abbott, McAllen, for combined passenger and freight stations at Linn, Barrosa, Rachal, Solino, Dix, Alsonia, and East Alsonia; section house layouts at Linn, Rachal and Edinburgh; agents' residences at Linn and Rachal; 20-car stock pens at Linn and Rachal; 30-car stock pens at Barrosa and Solino; a 25-car stock pen at Hartland, to cost about $120,000; to Worden and Henry for produce warehouses at Azahar and Primera, to cost $4,150 and $4,000 respectively; to William D. Uecker for produce warehouses at Alsa, La Villa and Santa Rosa, to cost $12,000; to the Thomas W. Blake Lumber Co. Houston, for a yardmaster's office at Edinburgh.

—Fritch. The Rock Island is said to have prepared plans for a reinforced concrete and steel bridge, 2,400 ft. long, over the Canadian River, the floor to be 152 ft. above water level. Estimated cost, $1,000,000.

—Millsap. The Texas & Pacific has awarded a contract to C. T. Scott, Millsap, for an earth dam for the creation of a water supply reservoir. The project involves a slight change of alignment at Millsap, excavation of about 70,000 cu. yd. of earth and the construction of several concrete culverts and a concrete bridge.

—Presidio. The Kansas City, Mexico & Orient has accepted a gift of 320 acres from the citizens of Presidio, to be used as a site for shops, enginehouse, and a station for the line now under construction between Las Norias, Chihuahua, and the Rio Grande.

WASHINGTON.—Hillyard. The Great Northern has awarded contracts for the installation of a treating cylinder, storage tanks and working tanks at the tie treating plant now under construction, to the Puget Sound Machinery Depot, Seattle, and to the Williams Brothers Co., Minneapolis. A contract for the steel building for housing the adzing, boring and incising machinery has been awarded to the Union Iron Works, Spokane.

—Seattle. The Northern Pacific, it is said, plans to build an addition 100 ft. in length to its pier, to cost $150,000.

—Spokane. The Great Northern has prepared plans to improve facilities at the freight station to cost about $60,000. The plans include paving near the freight station, concrete platforms and rearrangement of a number of tracks

WEST VIRGINIA.—Martinsburg. The Baltimore & Ohio is said to be making plans to aid in the construction of a community apple packing plant for fruit growers. It is estimated that $75,000 would be involved in the building itself.

WISCONSIN.—Milwaukee. The C. M. & St. P., has awarded a contract to the M. E. White Co., Chicago, for reinforced concrete highway subways at Center and Clark streets.

Locomotive Orders

According to the American Railway Association locomotives placed in service in the first six months of 1927 totaled 1,040 of which 258 were installed in June. In the first six months last year 1,117 were placed in service making a reduction of only seven per cent. It must be borne in mind however that the association's figures include new and leased equipment. The statement further shows that locomotives on order July 1, this year, were only 237 compared with 646 on the same date last year.

The records of the department of commerce show that 89 locomotives were shipped in June from the principal builders' plants. This compares with 109 shipped in May and 159 in June, 1926. The report shows a total of 478 steam and 92 electric locomotives shipped during the first six months this year compared with 787 steam and 114 electric for the first six months of 1926.

There doesn't seem to have been enough in locomotive inquiries or orders during July to write home about. The brightest spot in a rather dead market was the Chesapeake & Ohio's inquiry for 30 switchers, and the statement that the Erie will buy a couple of Diesel-electric engines.

There has been practically no change in the list of locomotive orders placed since January as shown in the table in the July issue. Consequently we are omitting publication of the list this month, but shall resume its publication in September.

Passenger Car Orders

Our records show a total of 73 passenger cars ordered for regular steam train service during July, 20 electric cars and 19 gas-electric cars. This brings

the total number of passenger cars ordered for the first seven months of this year, according to our records, to 1,390. The principal orders placed recently include 25 baggage and express cars for the Erie, ordered from the Standard Steel Car Co.; 12 for the Wabash, and 33 for the Santa Fe ordered from Pullman. The Chicago, North Shore & Milwaukee ordered 10 one-man cars, and the San Francisco Municipal Ry. ordered ten more street cars from the St. Louis Car Co.

Freight Car Orders

A recent statement issued by the car service division of the American Railway Association shows that 38,041 freight cars were placed in service by the Class I railroads during the first six months this year. This is a decrease of 15,541 cars compared with the number placed in service during the corresponding period last year; 7,790 cars were placed in service during June, including 4,333 box, 1953 coal and 1165 refrigerators. The A. R. A. further states that the railroads had 23 279 freight cars on order July 1 compared with 37,253 on the same date in 1926.

According to a report released July 29 the Class I roads had 299,948 surplus cars in good repair and available for service on July 14. This was an increase of 17,389 cars compared with July 7, at which time there were 282,559 cars. Surplus coal cars on July 14 totaled 99,048 cars, an increase of 10,935 cars within approximately a week while surplus box cars totaled 155,541, an increase of 6,943 for the same period. Reports also showed 21,645 surplus stock cars, a decrease of 232 cars under the number reported on July 7 while surplus refrigerator cars totaled 15,860 cars, a decrease of 81 for the same period.

The largest order for freight cars placed in July was that of the Chicago & North Western for 1,000 box cars. The order was divided between the Standard Steel Car and the General American. The Great Northern bought 250 70-ton gondolas from Pressed Steel. Scattered orders were placed for dump cars, the Clark Car Co. of Pittsburgh having received orders from the Western Maryland and the Johnson Mining Co. each for two cars. The Corn Products Co., Pekin, Ill., and the U. S. Cast Iron Pipe & Fdry. Co. also each ordered an extension side dump car from Clark. The Boston Elevated Ry. is said to have ordered four cars from the Differential Steel Car Co. and the Sunlight Coal Co. 10 30-yard capacity cars from Koppel.

Bus and Truck Orders

The statement from the department of commerce, based on reports received from 121 manufacturers in the United States, shows that in June, 40,178 trucks and buses were produced (factory sales). This compares with 40,802 for June, 1926, and brings the total for the first six months of this year up to 248,506, a gain over the same period last year of 13,047. The figures for June in Canada show a loss of 195 compared with June, 1926, the production in that country totaling 2,738 for the month.

Orders recently placed for buses include the following: International Motor Co., 7 from the New England Transportation Co., 2 from the Union Pacific Stages; 3 from the Iowa Southern Utilities Co., 2 from the Southern Pacific Motor Transport Co., 1 from the Motor Transportation Co. of the South; American Car & Foundry Motors Co., 4 from the Motor Transportation Co. of the South, 4 from the Shore Line Motor Coach Co.; White Co., 30 from the Cleveland Railway Co., one from the Motor Transportation Co. of the South; Yellow Truck & Coach Mfg Co., 2 from the Northland Transportation Co.

Changes in Personnel

Executive and Operating

J. L. Lancaster, president of the Texas & Pacific, has been elected president of the Abilene & Southern also with headquarters at Dallas. The jurisdiction of the executive officers of the Texas & Pacific has been extended to cover the Abilene & Southern. **J. B. Shackleford** has been retained as general freight and passenger agent of the Abilene & Southern, with headquarters at Abilene. **W. R. Lence,** executive general agent of the Texas & Pacific, has been appointed general manager of the Abilene & Southern, with headquarters at Abilene.

Albert L. Smith has been elected vice president of the Buffalo & Susquehanna.

C. L. Bradley, vice president of the Nickle Plate, with headquarters at Cleveland, has been elected president of the Cleveland Union Terminals Co. also succeeding **O. P. Van Sweringen,** resigned.

H. S. Robertson, vice president and general manager of the Denver Tramway, has been elected president succeeding **Ernest Stenger,** deceased. He will continue to act as general manager in his capacity as president.

Lester S. Ready, president of the Key System Transit Co., San Francisco, has resigned to assume a newly created position of vice chairman of the board. **A. J. Lundberg,** succeeds Mr. Ready as president.

J. H. Daggett has been elected president of the Manistee & Northeastern, with headquarters at Milwaukee, following the dissolution of the receivership. **S. J. Scott,** general manager for the receiver, has been elected vice president and general manager, with headquarters at Manistee.

Walter Buckner has been appointed general manager of the Gulf department of the American Railway Express Co., with headquarters at Atlanta, succeeding **W. S. McFarland,** deceased.

C. F. Smith, assistant to the president of the Cincinnati, Indianapolis & Western, at Indianapolis, has been appointed assistant to the general manager of the western lines of the Baltimore & Ohio at Cincinnati, following the merging of the management of the C., I., & W. with the Baltimore & Ohio.

J. J. Napier, superintendent on the central region of the Canadian National, with headquarters at Capreol, Ont., has been transferred to the western region, with headquarters at Brandon, Man., succeeding **George A. Cunliffe,** who has retired under the pension rules of the company. Other transfers are as follows: **M. B. Murphy,** to the central region with headquarters at Hornepayne, Ont.; **W. C. Owens,** to Fort Rouge, Man.; **J. H. McKinnon,** superintendent of the Duluth, Winnipeg & Pacific, at Virginia, Minn., to the western region with headquarters at Kamloops Junction, B. C.; **C. L. Harris,** to the Duluth, Winnipeg & Pacific at Virginia.

The jurisdiction of **E. F. Rummel,** general superintendent for the C. M., & St. P., at Butte, has been extended to include the Idaho division.

C. W. Pates, chief dispatcher of the Cincinnati, New Orleans & Texas Pacific (part of the Southern) at Somerset, Ky., has been appointed trainmaster of the first district, at Danville, succeeding **T. C. Blackwell,** promoted. **F. L. Farmer** succeeds Mr. Pates at Somerset.

F. S. Weisbrook, engineer of maintenance of way and structures of the Davenport, Rock Island & Northwestern, has been appointed general manager, succeeding **C. B. Rodgers,** retired because of ill health.

M. F. White, trainmaster of the Hoxie

and Doniphan districts of the Arkansas division of the Missouri Pacific, has been appointed operating rules instructor with headquarters at St. Louis. **E. W. Stanley** succeeds Mr. White as trainmaster of the Hoxie and Doniphan districts, with headquarters at Little Rock.

J. T. Watson, trainmaster at El Dorado, Ark., has been transferred to Little Rock, with jurisdiction over the Little Rock, Norman, Pike City, Nashville and Hot Springs districts.

B. O. Johnson, assistant to the operating vice president of the Northern Pacific, has been appointed assistant to the president, succeeding R. W. Clark. Mr. Johnson, who began his service with the Northern Pacific 27 years ago as a section laborer, was born at Winchester, Mass., May 25, 1878. He was graduated from Worcester Polytechnic Institute in 1900. He served the Northern Pacific railroad in the engineering department in minor capacities and in the operating department as roadmaster, trainmaster, and superintendent before joining the railway corps of the United States army in Russia. He served in Russia for 5½ years, first as major, then as lieutenant colonel, and finally as colonel, and was decorated by the French, Czecho-Slovakian, Chinese and Japanese governments. He became assistant to the vice president in charge of operation in April, 1923. **W. C. Sloan,** succeeds Mr. Johnson as assistant to the vice president in charge of operations. He is a graduate of Cornell University and began his railroad service with the Pennsylvania as inspector of New York tunnels in February, 1907. He has been in the employ of the Northern Pacific for 18 years, going to the general offices from Duluth, where he had been superintendent of the Lake Superior division. He was a captain in the U. S. army during the world war and served overseas. Other appointments are as follows: **O. F. Ohlson,** superintendent, transferred to the Lake Superior division, with headquarters at Duluth; **R. T. Taylor,** superintendent, Yellowstone division, with headquarters at Glendive; **J. A. Mercer,** assistant superintendent, at Billings; **Theodore Harris,** trainmaster at Livingstone; **Norman Slade,** trainmaster at Jamestown, N. D.; **B. F. Riggs,** trainmaster at Staples, Minn.

W. R. Triem has been appointed freight trainmaster on the Panhandle division of the central region of the Pennsylvania, with headquarters at Pittsburgh. **D. A. Callahan** has been appointed assistant trainmaster on the Wheeling division, with headquarters at Mingo Junction, Ohio.

R. L. Barrett, trainmaster on the Pittsburgh & West Virginia and the West Side Belt at Pittsburgh, has been appointed superintendent, with headquarters at Rook.

O. L. Young, superintendent of terminals on the St. Louis-San Francisco at Birmingham, has been transferred to Tulsa to succeed **S. R. Kennedy,** granted leave of absence because of ill health. **J. W. Skaggs** succeeds Mr. Young at Birmingham.

J. S. Crews has been appointed general superintendent of the following companies; the Raleigh & Charleston, with headquarters at Marion, S. C., and Macon, Ga.; the Chesterfield & Lancaster, with headquarters at Cheraw, S. C., and Macon; the Charlotte, Monroe & Columbia, with the same headquarters; the Tavares & Gulf, with headquarters at Tavares and Macon; the Savannah & Statesboro, with headquarters at Statesboro and Macon, and the Jacksonville, Gainesville & Gulf, with headquarters at Gainesville and Macon. The position of general manager on the Savannah & Statesboro has been abolished. **F. C. Summer** has been appointed superintendent of the Tavares & Gulf, with headquarters at Tavares. **D. C. Smith** has been appointed superintendent of the Savannah & Statesboro with headquarters at Statesboro. **H. W. Waits** has been appointed superintendent of the Jacksonville, Gainesville & Gulf, with headquarters at Gainesville.

J. W. Wassum has been appointed assistant to the vice president of the Southern Railway, with headquarters at Columbia.

D. H. Lusk has been appointed manager dining car service on the Southern Pacific, Texas and Louisiana lines, with headquarters at Houston. The positions of manager and assistant manager dining cars, hotels and restaurants have been abolished.

Financial and Legal

C. I. Sturgis, vice president, secretary and treasurer of the Burlington, has also been appointed assistant secretary and assistant treasurer of the Colorado & Southern. **H. W. Johnson,** comptroller of the Burlington, has in addition been appointed comptroller of the Colorado & Southern, succeeding **J. H. Bradbury,** who remains as comptroller of the Ft. Worth & Denver City, and the Wichita Valley. **W. F. Dobecki,** auditor of expenditures of the Colorado & Southern, has been appointed auditor.

Ralph Blaisdell has been appointed general auditor and assistant treasurer of the Florida East Coast, succeeding **M. F. Harden,** resigned.

C. F. Kuehl, auditor of the Manistee & Northeastern has been appointed treasurer and auditor.

F. M. Gilbough, assistant tax commissioner of the Missouri-Kansas-Texas, has been appointed assistant land and tax commissioner of the St. Louis-San Francisco, with headquarters at St. Louis.

Purchases and Stores

Frank A. Austin, general storekeeper of the Boston & Albany at West Springfield, has been appointed purchasing agent, with headquarters at Boston, succeeding **Frederic A. Ryer,** who has retired. **George E. Johnston,** storekeeper at Allston succeeds Mr. Austin at West Springfield.

T. M. McKeown, assistant purchasing agent on the Canadian Pacific with headquarters at Victoria, has been appointed purchasing agent with headquarters at the same point. **William Bell,** commissary purchasing agent at Victoria, succeeds Mr. McKeown.

John H. Nichols, general storekeeper of the Nickel Plate district of the New York, Chicago & St. Louis, at Cleveland, has been promoted to general storekeeper of the entire system, with headquarters at the same point. The jurisdiction of **R. Stewart,** storekeeper in charge of bridge, building and roadway material of the Lake Erie and Western district has been extended to cover the Clover Leaf district, with headquarters at Frankfort.

Traffic

George E. Boulineau has been appointed freight traffic manager of the Atlanta & West Point, the Western Railway of Alabama and the Georgia Railroad, with headquarters at Atlanta. **C. E. Rodenberg** has been appointed general freight agent and **J. M. Woodall,** assistant general passenger agent has been abolished.

Albert E. Crocker, general agent of the New York Central Lines at New Haven, has been appointed New England agent of the Boston & Albany, with headquarters at Boston, succeeding **John G. Church,** deceased. **John J. Woodis** has been appointed general agent of the Boston & Albany with headquarters at Boston. The office of east bound agent has been abolished.

C. E. Jefferson, general freight agent of the Canadian Pacific at Winnipeg, has been appointed assistant freight traffic manager of the western lines with the same headquarters.

The following appointments have been made by the Chesapeake & Ohio: **C. W. Haynes,** traveling passenger agent, Cincinnati, **W. R. Rhodes,** traveling passenger agent, Louisville, **H. C. Green,** traveling passenger agent, Huntington, **M. L. Murray,** traveling passenger agent, Charlottesville, **N. F. Brown,** city passenger agent, Washington. The offices of division passenger agent at Huntington and Staunton, are discontinued.

W. L. Burke, commercial agent on the

Chicago & Eastern Illinois, at St. Louis, has been appointed general agent at Buffalo succeeding **Russell Houston** who has been transferred to Louisville. **C. W. Thacker**, general agent at Louisville, has been transferred to Indianapolis where a new traffic office has been opened.

The Cincinnati, Indianapolis & Western is now operated as a part of the Baltimore & Ohio System, and is known as the Indianapolis division. The jurisdiction of **George W. Squiggins**, general passenger agent of the Baltimore & Ohio at Cincinnati and **John P. Dugan**, general baggage and milk agent at Baltimore has been extended over this division. **G. F. Scheer**, division passenger agent at Cleveland, has been appointed assistant general passenger agent at Indianapolis. **E. F. Schlottman**, division passenger agent at Columbus succeeds Mr. Scheer at Cleveland and **L. B. Jay** succeeds Mr. Schlottman at Columbus.

H. M. Cushing has been appointed division passenger agent of the Denver & Rio Grande Western at Salt Lake City. **A. J. Cronin**, assistant general freight and passenger agent has been relieved of all passenger duties.

O. D. Crockett has been appointed traffic manager of the Gainesville Midland with headquarters at Gainesville.

F. L. Jones, district passenger agent for the Illinois Central, at Houston, has been transferred to New Orleans.

W. V. Reid, chief clerk in the traffic department of the International-Great Northern and the Gulf Coast Lines at Houston, has been appointed assistant general freight agent at Houston succeeding **R. H. Schultz**, resigned.

W. H. Cummins has been appointed general freight agent and auditor-secretary of the Kansas & Missouri Railway & Terminal Co., at Kansas City.

H. T. Foster has been appointed auditor and traffic manager of the Laramie, North Park & Western, in addition to his present duties of assistant secretary and assistant treasurer, with headquarters as before at Laramie, succeeding **Ernest Carter**, resigned.

H. R. Smith has been appointed assistant general freight agent of the Missouri-Kansas-Texas, with headquarters at St. Louis.

James J. Hennessey, commercial agent of the Chicago & Eastern Illinois at Chicago, has been appointed district freight agent of the New Orleans Great Northern, in charge of the office at Chicago.

W. F. Nutt has been appointed industrial commissioner of the Lake Erie & Western and the Clover Leaf district of the Nickel Plate, with headquarters at Frankfort. **J. W. Brady**, general agent at Detroit, has been transferred to Pittsburgh, to represent the Nickel Plate-Clover Leaf districts, succeeding **A. B. Bierdeman**, who has been transferred to succeed Mr. Brady at Detroit, and **J. J. Lynch**, who has been appointed as a special agent in the traffic department of the Nickel Plate-Clover Leaf districts, with headquarters at Pittsburgh.

George Munro has been appointed general agent in the freight department of the New York Central, with headquarters at St. Paul. **David C. Heffernan** has been appointed general agent of the New York Central Lines, at New Haven, succeeding **Albert E. Crocker**, promoted.

R. W. Clark, assistant to the president of the Northern Pacific, has been appointed general traffic manager with headquarters at St. Paul. Mr. Clark, who was born October 4, 1880, at Petoskey, Mich., began his service with the Northern Pacific as a stenographer in the office of the chief engineer on January 1, 1902. He has held successively the positions of stenographer and chief clerk in the president's office, president's secretary and during the United States administration of railroads was assistant to the federal manager of the Northern Pacific. He became assistant to the president January 1, 1920.

R. W. Clark

B. F. Livingston, supervisor of service in the office of the chief of freight transportation of the Pennsylvania, has been appointed perishable traffic manager, a newly created position.

William D. Corfield has been appointed general freight agent of the Reading with headquarters at the Reading Terminal, Philadelphia, succeeding **Richard C. Campbell**, deceased.

R. P. Harrington, **W. F. Knobeloch** and **A. J. Lehmann** have been appointed assistant freight traffic managers for the St. Louis Southwestern, with headquarters at St. Louis. **A. H. Merck**, has been appointed assistant general freight agent and F. Pattie, soliciting freight agent, with headquarters at Little Rock.

John T. Ludlum, assistant freight claim agent of the Soo Lines with headquarters at Minneapolis, has been appointed freight claim agent at the same point, succeeding **Arthur E. Hodson**, who has retired at the age of 70. **F. M. Seiberlich** and **George A. Porter** have been appointed assistant freight claim agents with headquarters at Minneapolis.

S. B. Murdoch, general eastern passenger agent of the Seaboard Air Line at New York, has been appointed assistant passenger traffic manager, with headquarters at Norfolk and in New York. **W. Hugh Donny** succeeds Mr. Murdoch as general eastern passenger agent. **C. A. Carpenter**, has been appointed commercial agent, with office at Tavares, reporting to the district freight agent at Orlando.

R. R. Tompkins has been appointed division freight and passenger agent of the Southern Railway with headquarters at Columbus, Ga., succeeding **W. H. Griffs**, transferred. **G. C. Potter** has been appointed district freight agent with headquarters at Chattanooga, succeeding **W. C. Stephens**, retired.

L. H. Trimble, special representative of the general freight office of the Southern Pacific at Los Angeles, has been appointed general agent, perishable freight traffic, with headquarters at San Francisco.

E. A. Klippel has been appointed general agent passenger department of the Union Pacific with headquarters at Portland, Ore. **J. V. Carroll** has been appointed general agent at Riverside, Calif., succeeding **F. E. Middleton**, deceased. **W. F. Nash Jr.**, has been appointed general agent at San Pedro, Calif.

Eugene Fox, vice president of the Western Pacific, in charge of traffic, with headquarters at San Francisco, has been elected vice president of the Sacramento Northern and the Tidewater Southern also in charge of traffic. **Boke K. Smith**, passenger traffic manager, has been appointed also passenger traffic manager of the Sacramento Northern and the Tidewater Southern.

Mechanical

L. W. Thurston has been appointed road foreman of engines of the Portland division of the Boston & Maine, with headquarters at Portland, succeeding **C. P. Brooks**, transferred. Other appointments are as follows: **N. L. Wiggin**, system fuel supervisor at Boston; **J. R. Annis**, fuel supervisor, Portland

division, at Portland; **W. H. McClenathan,** fuel supervisor, White mountains, Passumpsic and Southern division (north of Concord, N. H.) at Woodsville, N. H.; **Charles Furness,** acting master mechanic of the Portland division.

K. F. Nystrom, engineer, motive power and rolling stock, for the C. M. & St. P. at Chicago, has been appointed master car builder with headquarters at Milwaukee, succeeding **C. G. Juneau,** deceased. Mr. Nystrom was born in September, 1881, in Sweden, graduating from a Swedish university in 1904 as mechanical engineer. Soon after coming to the United States in November, 1905, he entered the service of the Pressed Steel Car Co. as a draftsman, where he remained until February, 1909, when he joined the engineering staff of the Pullman Co. In September of the same year he entered the mechanical department of the Southern Pacific. He became assistant mechanical engineer of the American Car & Foundry Co. in June, 1911, and mechanical engineer of the Acme Supply Co., Chicago, in July, 1912. Mr. Nystrom returned to railway service in September, 1913, when he was appointed chief draftsman of the car department of the Grand Trunk, with headquarters at Montreal remaining in that position until November, 1918, when he was appointed to a similar post on the Canadian Pacific. In January, 1920 he returned to the Grand Trunk as engineer of car construction. In January, 1922 he entered the service of the C. M. and St. P. as engineer of car design. He was promoted to engineer of motive power and rolling stock in January, 1925, a position he held until his promotion to master car builder on July 9.

L. K. Sillcox, general superintendent of motive power at Chicago, has been granted leave of absence of two months. All officers and employes in the locomotive department will report direct to R. W. Anderson, superintendent of motive power, and those in the car department to K. F. Nystrom, master car builder, both at Milwaukee.

W. E. Harmiston, master mechanic on the western district of the Erie, at Kent, has been transferred to Fort Jervis in the same capacity, in charge of mechanical work on the Delaware and Wyoming divisions.

C. A. Fisher, fuel supervisor on the Great Northern, at Hillyard, has been appointed master mechanic, with headquarters at Grand Forks.

The jurisdiction of **J. L. Butler,** master mechanic of the Illinois division of the Missouri Pacific, has been extended to cover the Missouri division and his headquarters has been transferred from Dupo, Ill., to Poplar Bluff. **W. A. Curley,** master mechanic of the Missouri division, at Poplar Bluff, has been transferred to the Little Rock division, at McGehee. The jurisdiction of **J. M. Whalen,** master mechanic at St. Louis, has been extended to cover the entire St. Louis terminal. **W. B. Shea,** general car inspector at Kansas City, has been appointed superintendent of shops at DeSoto.

F. E. Boehm has been appointed road foreman of engines of the Fort Wayne division of the western region of the Pennsylvania, succeeding **E. A. Burchiel,** promoted to trainmaster.

Civil

H. H. Orr, signal engineer of the Chicago & Eastern Illinois at Chicago, has been appointed superintendent of signals and telegraph at Danville following the retirement of **C. McCormack,** superintendent of telegraph, and the merging of the signal and telegraph departments under one organization.

E. L. Waltz, signal and telegraph supervisor on the Chicago Great Western with headquarters at St. Paul, has been appointed superintendent of signal construction with headquarters at Chicago.

C. J. Swane, assistant engineer on the C. M. & St. P., at Milwaukee, has been appointed division engineer with headquarters at Miles City.

S. F. Grear, office engineer of the Illinois Central at Chicago, has been appointed assistant engineer of bridges and buildings with the same headquarters, succeeding **Charles Chandler** who has resigned to enter the service of the J. G. Brill Co., Philadelphia.

The headquarters of **H. Israel,** division engineer of the Illinois division of the Missouri Pacific, has been transferred from Illmo, Mo., to Bush, Ill.

W. L. Curtiss, mechanical engineer of the Exterior zone of the New York Central, Buffalo and east, with headquarters at New York, has been appointed engineer of water service with the same headquarters. **Earl B. Smith,** signal supervisor east of Buffalo, has been appointed assistant signal engineer of the Grand Central Terminal and electric division with headquarters at New York.

E. W. Everett, designing engineer of the New York Central's Grand Central Terminal with headquarters at New York, has been appointed assistant terminal engineer, Grand Central Terminal. The position of designing engineer, Grand Central Terminal, has been abolished.

H. M. Hockman, assistant engineer on the Clover Leaf district of the Nickle Plate, with headquarters at Frankfort, has been appointed division engineer on the Nickle Plate district with headquarters at Cleveland, succeeding **W. H. Burrage,** deceased.

M. H. Brown, Jr., has been appointed division engineer of the Montana division of the Oregon Short Line, with headquarters at Pocatello, Idaho.

A. H. Sturdevant, assistant engineer in the office of the district engineer of the Rock Island at El Reno, has been appointed division engineer of the Panhandle division, with headquarters at the same point.

C. M. Cannon, division engineer of the South Florida division of the Seaboard Air Line, at Arcadia, has been appointed district engineer maintenance of way of the southern district, with the same headquarters, succeeding **J. W. Sexton** who has been transferred to the transportation department of the North Carolina division. **G. C. Ruskell** succeeds Mr. Cannon as division engineer at Arcadia.

B. J. Simmons, assistant engineer on the Western Pacific at San Francisco, has been appointed engineer of maintenance of way and structures at the same point. **T. L. Phillips,** assistant engineer at San Francisco, has been appointed principal assistant engineer at the same point. **C. P. Gilmore,** general supervisor of maintenance of way and structures at Oakland, has been appointed general supervisor of bridges and buildings, at the same point.

R. P. Long, supervisor on the Wabash at Chicago, has been promoted to division engineer with headquarters at the same point, succeeding **S. N. Crowe** who has been transferred to Moberly.

Obituary

Fred L. Berry, formerly district sales representative of the Iron Range territory of Fairbanks, Morse & Co., with headquarters at Minneapolis, died July 12.

Harley W. Brundige, a member of the California state railroad commission, died at Los Angeles, July 18.

Chas. W. Bryan, chief engineer of the American Bridge Co., New York, died in the New Rochelle hospital, June 25.

Thomas W. Burke, trainmaster of the Tennessee Central, and R. L. Mauk, master mechanic, both with headquarters at Nashville, were killed near Ringgold, July 17, as the result of an accident which occurred while they were supervising the clearing up of a wreck.

R. M. Fleet, assistant to the general manager of sleeping, dining and parlor cars and railway restaurants of the Canadian National, died at Winnipeg June 30, of heart disease.

Frank F. Gilmore, Jr., manager of the Louisville safety council, died July 14, aged 43.

Frank Joseph Hecker, superintendent of the Eel River (now a part of the

Wabash) from 1870 to 1879, died at his home in Detroit, June 26.

Clarence W. Huntington, formerly president of the Virginian Railway, died at his home in Elizabeth, N. J. July 12, after a two day illness.

Junius Bertram Irving, president of the Irving-Pitt Manufacturing Co., Kansas City, died at Gordon, Wis., June 20.

J. D. Keiley, division engineer of the Chesapeake & Ohio at Clifton Forge, was killed July 8, when a track motor car in which he was riding was struck by an express train at Fordwick.

William Charles Kidd, sales representative of the Ramapo Ajaz Corpn., Hillburn, N. Y., and secretary of the Track Supply Association, died at his home in Suffern, July 5, following several months of illness.

Paul Kircher, vice president of the Canadian Concrete Products Co., Ltd., and resident manager of the Union Switch & Signal Co., at Montreal, died in Chicago June 10.

Wilmot K. Morley, president of the Grand Rapids, Grand Haven & Muskegon, died at Grand Rapids, July 13, after an extended illness, aged 78.

W. S. McFarland, general manager of the Gulf department of the American Railway Express Co., died at his home in Atlanta, July 5, after an illness of several months.

Jay B. Odell, a vice president and director of the Western Electric Co., died in the New Rochelle hospital, July 8, following an operation for appendicitis.

H. Clay Pierce, chairman of the board of directors of the Mexican Central from 1900 to 1910 and chairman of the local board of its successor, the National of Mexico, from 1910 to 1914, died at New York June 28, aged 78.

C. J. Scribner, assistant engineer of scales of the Burlington at Chicago, died in that city, July 13.

Garrett Townsend, president of the Middletown & Unionville, died at his home in Middletown, July 15.

B. F. Bush

B. F. Bush, chairman of the board of directors and former president of the Missouri Pacific Ry., died at St. Louis July 29. He was 67 years of age. He leaves a widow and one daughter, Mrs. George W. Holmes.

Mr. Bush was born at Wellsboro, Pa., and took up railway work as a young man. He was connected at one time with the Northern Pacific and the Union Pacific railways and was president of the Western Maryland Railway for four years.

He was elected president of the Missouri Pacific, and the Iron Mountain in 1911, and two years later was made president of the Denver & Rio Grande and also the Western Pacific. He found the direction of the latter two lines too great, however, and in 1915 retired to devote his entire attention to the Missouri Pacific.

Mr. Bush's career in railroad work began as a rodman on the Northern Pacific Ry. in 1882. From this position he advanced rapidly his official record, containing these appointments: Division engineer, Union Pacific, in Idaho and Oregon, 1887-1889; chief engineer and general superintendent Oregon Improvement Co., Seattle, 1889-96; general manager North Western Improvement Co., Roslyn, Wash., 1896-1903; fuel agent Missouri Pacific, St. Louis, 1903-07; president 1907-08, receiver 1908-10, again president 1910-11. Consulting engineer U. S. geological survey 1900; appointed by President Roosevelt member advisory board of fuel and structural materials, 1907; member, American Mining Congress, American Society of Mining Engineers; regional director southwestern district U. S. Railroad Administration during the war.

Supply Trade Notes

The **Chicago Pneumatic Tool Co.,** New York, announces the removal of its Seattle branch office, service department and warehouse, effective August 1, from 119 Jackson street to 1743-47 First avenue, south.

The **Electric Service Supplies Co.,** Philadelphia, announces that **R. P. Dunmire** has been engaged as insulator specialist. **H. E. Palmer** recently joined the sales force of the company and will cover Maryland, District of Columbia, Virginia and West Virginia, with headquarters at Philadelphia. **Geo. E. Ackerman** will have charge of railway lighting and industrial business in Indiana and southern Michigan with headquarters at Chicago.

The merger of the **Bucyrus Co.,** South Milwaukee, and the **Erie Steam Shovel Co.,** Erie, was approved by the directors of both companies July 20. A third company will be organized and will take over the assets of the present companies. Holders of preferred stock in both companies will receive preferred stock in the new company, share for share. Holders of the common stock of the Erie company are to receive convertible preference stock of the new company, carrying a yearly dividend of $2.50, dependent upon the payment of $1 a year on the common stock. All the common stock of the new company will be taken over.

J. F. Schumacher, formerly of the **Bourne Fuller Co.,** has become a partner in the **Steel Mill Products Co.,** Chicago.

The **Power Specialty Co.,** New York, and the **Wheeler Condenser & Engineering Co., Carteret,** have been consolidated, as have the subsidiaries of both companies, and will be known in the future as the **Foster Wheeler Corpn.** No changes in the products are contemplated, and no changes in the management will be made. The officers of the new company are **J. J. Brown,** chairman of the board; **Pell W. Foster,** vice chairman and treasurer; **L. B. Nutting,** president; **John Primrose, H. S. Brown,** and **W. E. Dowd Jr.,** vice presidents; **David McCulloch,** secretary and general manager, and **W. F. Keenan, Jr.,** chief engineer.

E. L. Morris, sales agent of the **Highland Iron & Steel Co.,** in Chicago has accepted a position as sales agent for the **Pittsburgh Steel Products Co.,** in its Chicago office.

C. R. Naylor has been appointed manager of western sales of the **Gould Car Lighting Corpn.,** with headquarters at Chicago, succeeding **George R. Berger,** who has resigned to enter business for himself. Mr. Naylor is also manager of western sales of the Symington Co., and the Gould Coupler Co.

M. J. Harkless, formerly an engineer of the railway and marine supply de-

partment of the **Buda Co.**, Harvey, has been appointed sales engineer of the contractors' department of the **Independent Pneumatic Tool Co.**, Chicago.

The **Petroleum Electric Co.**, Tulsa, has been appointed representative of the **Roller-Smith Co.**, New York, for Oklahoma.

James W. Bancker, controller of manufacture of the **Western Electric Co.**, has been elected a director and vice president in charge of purchasing and traffic, succeeding Jay B. Odell, deceased. **W. F. Hosford**, engineer of manufacture, succeeds **Mr. Bancker. David Levinger** has been appointed engineer of manufacture, and **J. R. Shea**, superintendent of manufacture development, both with headquarters at Chicago.

The **Massachusetts Mohair Plush Co.**, has moved its Boston office from 200 Devonshire street to the Chamber of Commerce building, 80 Federal street.

L. C. Hensel, formerly sales representative of the **Edison Storage Battery Co.**, Chicago, has been appointed sales engineer of the **Gould Car Lighting Corpn.**, with headquarters at Chicago.

W. F. Graver, vice president and treasurer of the **Graver Corpn.**, East Chicago, has been elected president and treasurer, succeeding **J. P. Graver**, who has resigned as president but remains as second vice president. **K. W. Bartlett**, general manager, has been elected third vice president, and **A. E. Lucius** of Lucius, Buehler & Lucius, Chicago, legal representatives of the company, has been appointed assistant secretary. **P. S. Graver** remains as first vice president in charge of manufacturing and sales and **H. S. Graver** remains as secretary.

Roy A. Hauer, manager of the general bus department of the **Mack-International Motor Truck Corpn.**, New York, has been elected a vice-president of the company. He will continue as general manager of the bus department. Mr. Hauer has been with the company many years and has filled various positions in the field and at the head office.

The Mack Company announces also the election of **A. C. Fetzer**, assistant general sales manager; **J. N. Bayne**, Newark branch manager; **K. M. Blake**, New York branch manager, as vice-presidents. Mr. Bayne and Mr. Blake will head the North Jersey division and Greater New York division respectively. **O. J. Evers** was also elected a vice-president. The elections were effective July 1. **William R. Rhoades** has been appointed branch manager of the Scranton sales and service branch.

Claude A. Lyon, formerly with the **Regan Safety Devices Co.**, has been appointed assistant sales manager in charge of railroad sales of the **Service Caster & Truck Co.**, Albion, Mich., with headquarters in the Tribune Tower, Chicago.

Thomas Mahar has been appointed manager of the service department of the **American Arch Co.**, with headquarters at New York.

The **American Rolling Mill Co.**, Middletown, has purchased the **Columbia Steel Co.** and the **Forged Steel Wheel Co.** of Pittsburgh, subsidiaries of the **Standard Steel Car Co.** The St. Louis office has been moved from the Boatman Bank building to 901 Ambassador building.

The **Brown Bevis Co.**, 470 East Third street, Los Angeles has been appointed agent for the Climax geared locomotives for California, Arizona and Mexico. Five of these locomotives are being operated by the Southern California Edison Co., and one by the San Joaquin & Eastern. This company reported recently having sold eight 4-yd. Koppel cars to the City of Los Angeles water and power department; heavy rails to a San Diego contractor for navy department work, and to the Southern California Edison Co. and many small orders for light rails.

Walter C. Carroll, vice president of the **Inland Steel Co.**, Chicago, has resigned to become president of the **National Association of Sheet and Tin Plate Manufacturers**, with headquarters at Pittsburgh.

Charles F. Simpson has been appointed district enginer for Tennessee for the **Portland Cement Association**, with office at Nashville.

W. B. Murray, vice president and chief engineer of the **Miller Train Control Corpn.**, has been appointed also sales engineer of the company.

The **Foote Bros. Gear & Machine Co.**, Chicago has appointed the following sales agents: **the Briggs-Shaffner Co.**, Winston-Salem; the **Circle Corpn.**, Tulsa; and the **Houston Armature Works**, Houston. **G. W. Craighead** has been appointed district representative in eastern Michigan, with headquarters at Detroit.

F. H. Landwehr, secretary of the **Electric Auto-Lite Co.**, Toledo, has also been elected president of the **Prest-O-Lite Storage Battery Corpn.**, Indianapolis. **J. H. McDuffee**, general sales manager of the Prest-O-Lite Co., has been elected vice-president and **J. B. Motley** credit manager of the **Prest-O-Lite Co.** has been elected secretary. **J. B. Fenner**, formerly associated with the **Price-Waterhouse Co.**, New York, has been elected treasurer.

The **Copperweld Steel Co.**, Rankin, Pa., has announced the purchase of a 20-acre mill site, improved with 10 acres of brick buildings, with heavy steel reinforcement, at Glassport, Pa., just a few miles from the company's present location.

Paul D. Cravath, for 30 years general counsel of the **Westinghouse Electric & Manufacturing Co.**, has been elected temporary chairman of the board, to succeed **Guy E. Tripp**, deceased.

The **Electric Storage Battery Co.**, Philadelphia, has moved its Detroit branch quarters from 5740 Cass avenue to 8051 West Chicago boulevard. The company recently opened a new factory branch at 1955 Hunting Park avenue, Philadelphia.

Aubrey J. Grindle, vice president of the **Grindle Fuel Equipment Co.**, Harvey, a subsidiary of the **Whiting Corpn.**, has resigned to organize the **Pulverized Fuel Equipment Co.**, Chicago.

The **Ingersoll-Rand Co.**, New York, has opened a branch office of 236 High street, Newark, in charge of **F. K. Armstrong**, formerly connected with the New York sales branch.

J. Dalrymple Rogers, formerly manager of the London, England, office of the **Baldwin Locomotive Works**, has been appointed London representative of the **International Railway Supply Co.**

The **Pullman Co.**, stockholders have ratified plans for organizing a holding company under the name of **Pullman, Inc.**, to take over the interests of the Pullman Co., and the Pullman Car & Manufacturing Corpn. Under this plan 2½ shares of new holding company stock will be issued for every share of Pullman Co., stock now held.

T. J. Powell, 2089 Railway Exchange building, St. Louis, has been appointed St. Louis representative of the **Rome Iron Mills, Inc.**

Charles R. Ellicott, eastern manager of the **Westinghouse Air Brake Co.**, has been elected resident vice president with headquarters at New York. **Carl H. Beck**, for seven years assistant eastern manager, has been appointed general sales manager, with headquarters at Wilmerding.

I. N. Tate, assistant general manager of the **Weyerhaeuser Sales Co.**, Spokane, has been appointed general manager, succeeding **Louis S. Case**, resigned. **Don Lawrence**, district manager at Spokane, succeeds Mr. Tate.

The **Whiting Corpn.**, has appointed the following representatives: the **Eichman Machinery Co.**, Kansas City, in Kansas and part of Missouri; the **Huey & Philp Hardware Co.**, Dallas, in Oklahoma and part of Texas; **L. H. Staley**, New Orleans, in Louisiana, the southern half of Mississippi, and in Mobile; the **H. B. Wilson Co.**, St. Louis, in Arkansas.

Henry S. Day, manager of the transportation division, **Westinghouse Electric & Manufacturing Co.**, has been ap-

pointed by the United Electric Railways, Providence, as superintendent of equipment. For the past five years he has had charge of all Westinghouse transportation activities in New England.

Burton L. Delack, assistant manager of the Schenectady works of the **General Electric Co.,** since December, 1926, has been appointed acting manager, succeeding **C. E. Eveleth,** elected a vice president. **Edward A. Wagner,** managing engineer in charge of all distribution transformers, with headquarters in Pittsfield, has been made acting manager of the Pittsfield works, succeeding **C. C. Chesney,** now a vice president in charge of manufacturing. **Giuseppe Faccioli,** works engineer of the Pittsfield works, has been appointed associate manager and works engineer of the Pittsfield works. **E. D. Treanor** has been appointed managing engineer of the distribution transformer department at the Pittsfield works. As managing engineer of that department, Mr. Treanor will have general supervision also of the engineering on distribution transformers manufactured at the Fort Wayne, Ind., and Oakland, Cal., works of the company.

The **Air Reduction Co., Inc.,** New York has purchased the business, insofar as the manufacture and sale of oxygen, acetylene, and kindred products are concerned, of the **United Gas Improvement Contracting Co.,** a subsidiary of the **United Gas Improvement Co.,** and the **United Oxygen Co.,** Philadelphia. The purchase includes oxygen plants at Philadelphia, Chester, Milton, Enola, and Reading, and an acetylene plant at Bridgeport, Pa.

The **General Electric Co.** has entered the custom moulding business according to a recent announcement by E. O. Sheve, manager of the industrial department of that company. The product will be marketed under the trade name "Textolite Moulded." For many years this company has operated, for its internal requirements, two large plants devoted to the moulding of a large variety of moulded forms for mechanical and electrical purposes, including radiotron bases, knobs, dials and sundry parts; parts of industrial control equipment, wiring devices and all forms of moulded insulation. These two plants will be devoted to this new business, under the direction of **H. D. Randall.**

Orders received by the **General Electric Co.** for the three months ending June 30 amounted to $78,105,247 compared with $78,972,062 for the second quarter of 1926, a decrease of one per cent, President Gerard Swope has announced. For the six months ending June 30, orders totalled $155,655,828, representing a decrease of six per cent compared with $165,405,720 in the corresponding six months of 1926.

A New Paint Spray Unit

The Alexander Milburn Co., Baltimore, Md., has recently placed on the market a paint spray unit known as the Milburn Type E1 Siphon-feed Outfit. The Type E1 Outfit with the Type E Gun furnished is adaptable to a wide range of painting. It is used for painting and lacquering automobiles, furniture and for general all round painting, and will operate efficiently whether using heavy anti-corrosive paints or very thin lacquers. The gun can be adjusted for such fine work as touching up, shading and high lighting up to larger work.

An ordinary garage air compressor affords a sufficient volume of air to operate the Milburn gun. The atomization of the Milburn Spray is so fine and even that "orange-peel" is eliminated, minimizing sanding and rubbing. The atomized spray is surrounded by an air pocket which lessens the loss of material, utilizing the entire spray in thoroughly covering the surface. This means greater coverage with minimum paint consumption.

The Milburn Air Purifier is of scientific construction, delivering only pure, dry air to the gun. This is essential for good finishing results. The air, upon entering the purifier, passes through a series of double baffles which extract moisture and other impurities from the air.

Milburn Paint Spray Unit

This unit is complete, ready to begin work. It consists of the Milburn Type E Gun with quart container, air conditioner, air regulator and 25 feet air hose with necessary connections and is built to withstand constant service. Its wide range of usefulness makes it a valuable asset to every paint department.

New Aluminum Arrester

In an improved lightning arrester introduced by the General Electric Co. for direct current railway service, the voltage per cell has been reduced, thus affording longer life. The new type of cells, with balancing resistances direct connected, can be substituted easily in the boxes in place of units now in service. Although these improved arresters have just been put on the market, they have been thoroughly tested on railway properties operating in localities where lightning conditions are unusually severe.

If you cannot win, make the one ahead break the record.

SHANNAHAN BROS., INC.
RAILROAD CONSTRUCTION SINCE 1904
Track Material—Equipment—Grading—Excavating
Track Layouts for Industrial Plants
Phone: MUtual 7507
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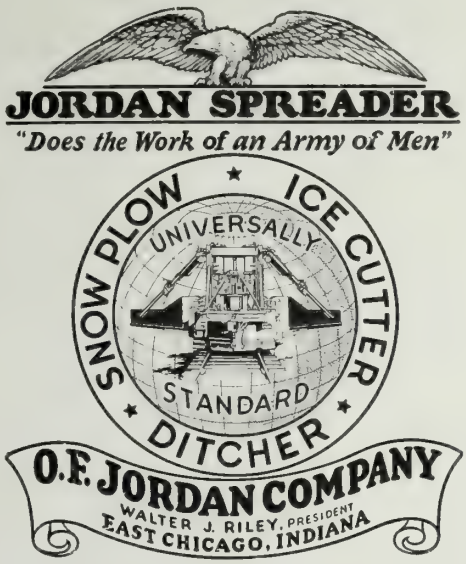

The JORDAN is an all-the-year-'round machine. It spreads materials, digs ditches, moves earth, rips out ice, fights snow.

Jordanized Ditchers aid proper drainage.

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

For detailed description see Car Builders Cyclopedia

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Center Plates
Draw Bar Yokes
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Air Brake Pins
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Miscellaneous Forgings

Send us your specifications

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'RALSTON BUILT'

Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
COLUMBUS, OHIO

Transportation

JUST THINK A MOMENT—

Whatever else a draft gear may be and do it must FIRST, LAST and ALWAYS PROTECT—not alone itself, but the cars and their lading.

PROTECTION! That's what draft gear is for. Think it over.

Our business is not alone that of making draft gear, but that of supplying railways with this PROTECTION.

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No obligation.

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IS A DRAFT GEAR

FOR?

Sessions gears stand the gaff. Your pocket book doesn't have to.

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PROTECTION
FOR CARS AND LADING

STANDARD COUPLER CO.

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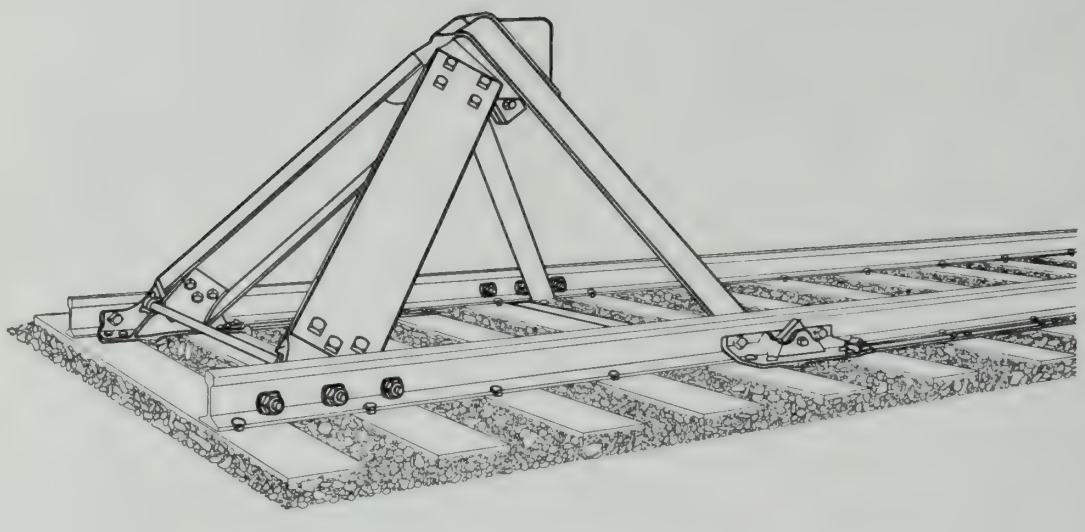
SEPTEMBER 1927

25¢

The Hayes Type W Bumping Post



The Hayes Type W Bumping Post is made in one size which fits any tee rail from 4 to 7 inches high with a base not wider than 6 inches. The striking face of the bumping post head is standard coupler height.

The parts are steel and malleable. No gray iron or semi-steel is used. The head is highest quality coupler steel.

Vital points in any bumping post are the connections to the track. In Type W these connections are made, not only to the track rails but also direct to the ties, by carefully designed steel tension joints and malleable iron compression joints.

The shock is carried direct to eight cross ties and through these to the ballast and earth.

All bolts are in simple shear only; none of them are subject to any combination of shear and tension or bend.

Every Type W post is completely assembled in the factory. The parts are so formed that they cannot go together wrong. Each part is finished to templets which insures perfect fitting. All of the parts may be bought separately for exactly the same as a complete post.

Type W is medium priced and is designed for simple and cheap installation. It is erected one piece at a time and two men are all that are needed for the work.

Experience in use has proved that Type W stands severe service repeatedly with minimum damage either to the cars or to the post. Type W is not destroyed when knocked out. It can be restored to service at a minor fraction of its original cost.

Hayes Track Appliance Co., Richmond, Indiana

LESS WEIGHT

LESS AIR

LESS WEAR

Less weight Schaefer truck and body levers with our truck lever connections will reduce the weight of the average foundation brake gear approximately ninety pounds.

Less air Ninety pounds reduction in the weight of the car represents an appreciable yearly transportation saving, but this weight reduction when applied to parts which are actuated by compressed air means a material decrease in amount of air required to start and move the reciprocating parts, and a corresponding increased saving.

Less wear Schaefer Brake details are made accurately from a harder grade steel. Records over a period of years show no appreciable wear in pin holes. A smoothly drilled hole to begin with will prevent the initial abrasion so destructive to brake pins, and the lighter weight works likewise toward decreased wear and longer effective life.

To effectively eliminate foundation brake gear troubles specify Schaefer.

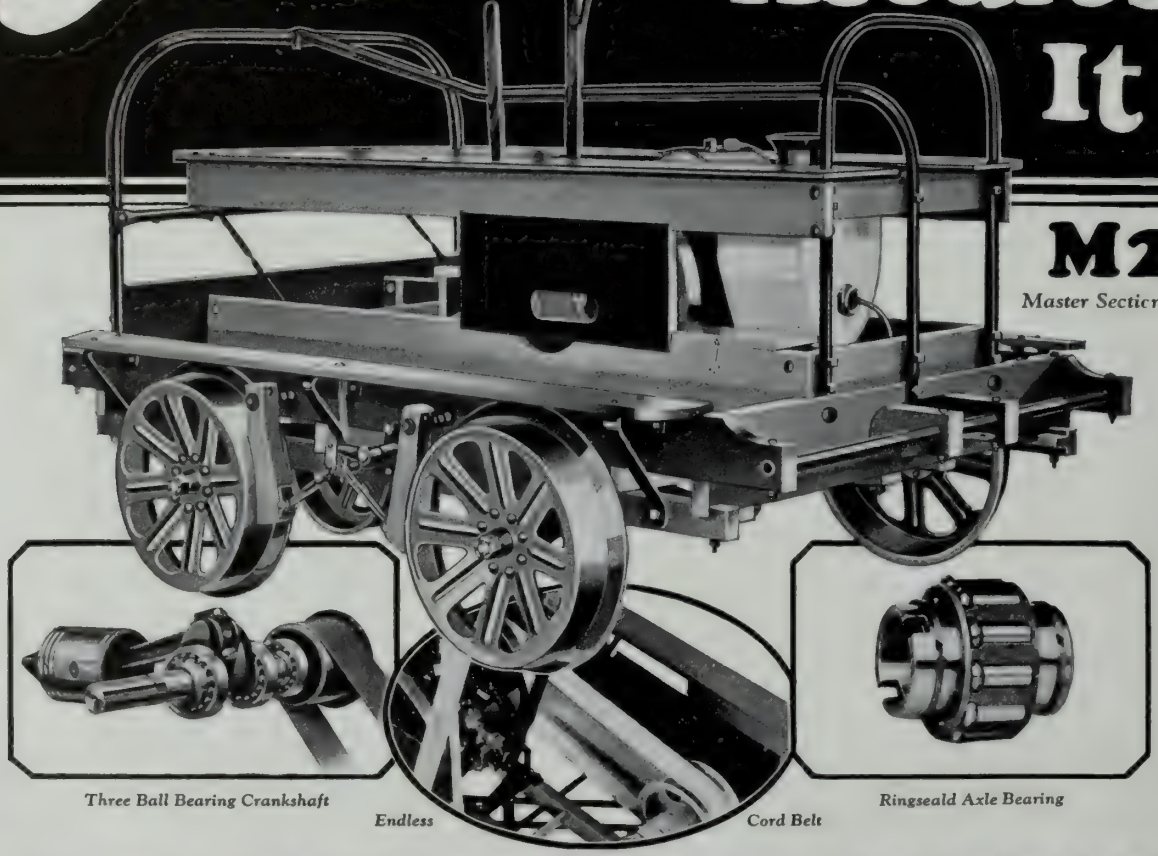
STRENGTH EFFICIENCY HOMOGENEITY

TRADE MARK

Schaefer Equipment Co.

General Offices: Oliver Bldg., Pittsburgh, Pa.

Dependability — and how Fairmont Assures It



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1 *Endless Cord Belt* has four times the strength of laced belt, lasts longer than chain, and cannot fail suddenly.
2 *Ringseald Axle Bearings* hold oil longer, and cannot cut the axle.
3 *Flat Disc, Square Shoulder, Press Fit Wheel Hubs* keep rivets tight and prevent motor car accidents.
4 *Water Cooled Engine* cannot be stalled by slow, hard pulls, head winds or hot water.
5 *Oil Mixed in Gasoline* lubricates perfectly, without attention.
6 *No Valves in Explosion Chamber* prevent failure and reduce upkeep.
7 *Three Ball Bearing Crankshaft* saves power and ends bearing trouble.
8 *Oversize Crank Pin Bearing* gives longer service without adjustment.
9 *Ringseald Crankshaft Packing* stays good for years, keep power *up* and fuel consumption *down*.
10 *Carburetor has only one adjustment.* Vertical check valve gives greatest length of service.

FAIRMONT PRODUCTS

Section Motor Cars A2—M2—S2—M14
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Push Cars and Trailers T1—T2—T3—T20—T2.
Gang and Power Cars AT2—MT2—ST2
Roller Axle Bearings Ringseald—Axlsaver—Hyatt
Weed Burners C(M27)—B(M27)
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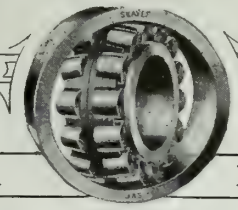
SKF Journal Bearings are basically better than plain bearings



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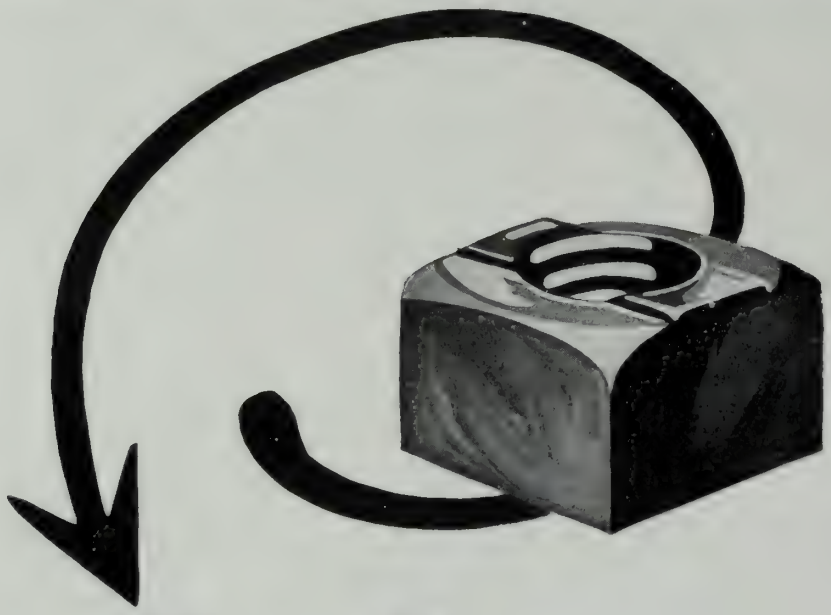

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Transportation

The Monthly Magazine of the Transportation Industries

SEPTEMBER, 1927

VOLUME ONE NUMBER FIVE

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Meetings in September

THE Traveling Engineers' Association and the Railway Equipment Manufacturers' Association will assemble at the Hotel Sherman, Chicago, September 13, and continue their sessions to and including September 16. The principal speakers announced are, R. H. Aishton, president, American Railway Assn.; C. H. Markham, chairman, Illinois Central R. R.; T. C. Powell, president, C. & E. I. Ry.; L. K. Sillcox, general superintendent motive power, C. M. & St. P. Ry.

At the same hotel, August 31 to September 2, the American Railway Tool Foremen's Assn., will have its convention. There will be also an exhibit by the supply association affiliated with the organization.

The International Railway General Foremen's Assn., is to meet in Chicago, September 6-9, Equipment Painting Section, A. R. A., September 13-15, Hotel Kentucky, Louisville; Roadmasters' & Maintenance of Way, Assn., September 20-22, Buffalo, exhibit by the Track Supply Assn.; Railway Treasury Officers' Assn., September 1-3, Detroit.

The Signal Section, A. R. A., will meet at the Mount Royal hotel, Montreal, September 13-15.

Steam Railroad Section, National Safety Council, will hold its sixteenth annual congress at Chicago September 26-30.

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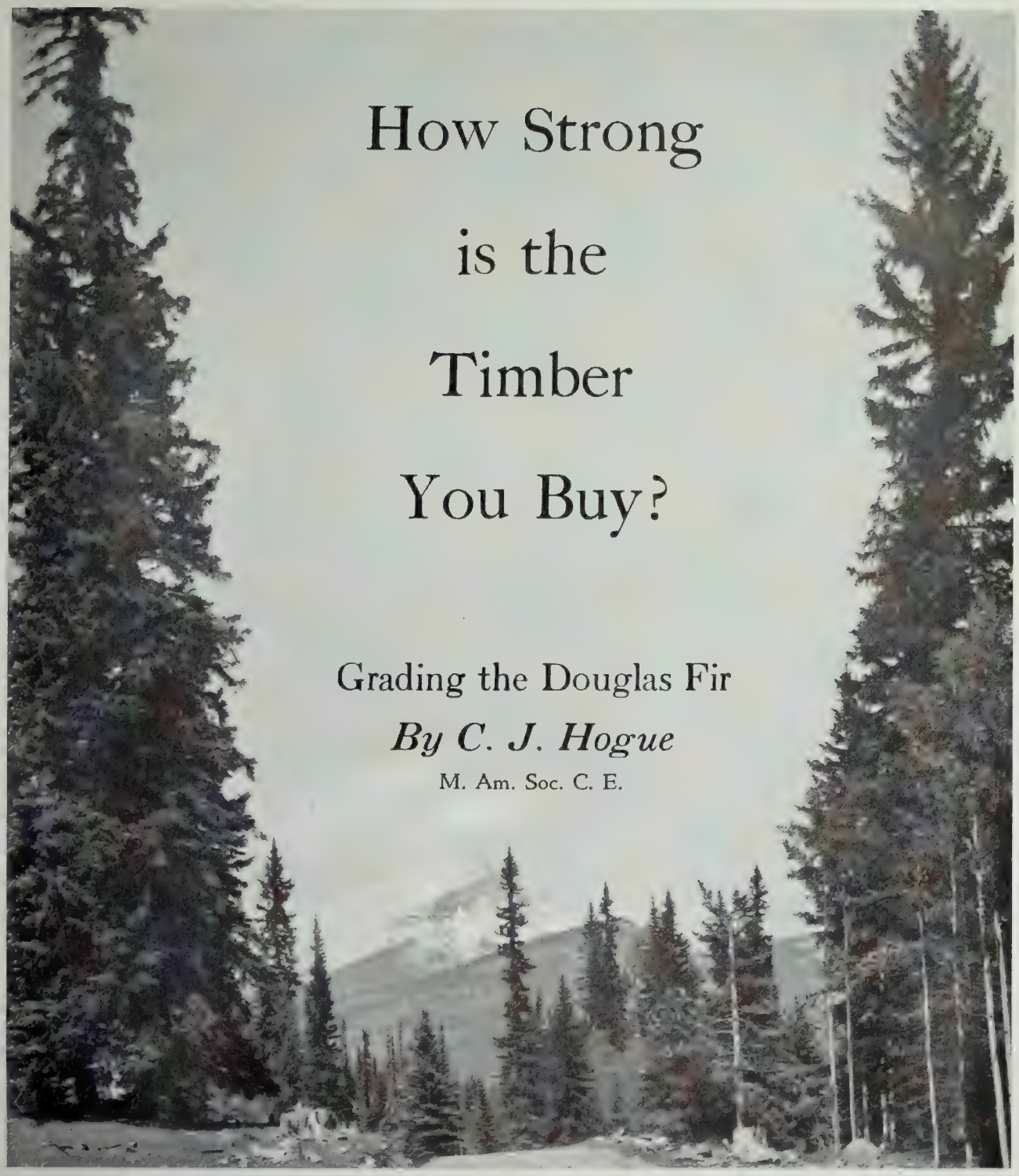


How Strong is the Timber You Buy?

Grading the Douglas Fir

By C. J. Hogue

M. Am. Soc. C. E.

A DECISION of great importance to purchasing, operating and maintenance departments of American and Canadian railroads was announced by manufacturers of Douglas fir early in July when a large group of West Coast mills gave publicity to their intention to begin at once grade marking structural items. Hereafter these leading mills will supply, on order, "Structural," or "Dense Structural," grades in all kinds of cuttings and every piece will be marked plainly so that the buyer may know he is getting the exact strength specified by the engineer or architect to suit the requirements of the work at hand.

Because railroads, in the United States and Canada, are the largest buyers and users of the higher grades of timbers in all sizes, the effect of grade marking these special Douglas fir items, West Coast millmen believe, will be to stimulate the use of this species for the reason that buying can now be done on the basis of assured and guaranteed quality for the purposes intended.

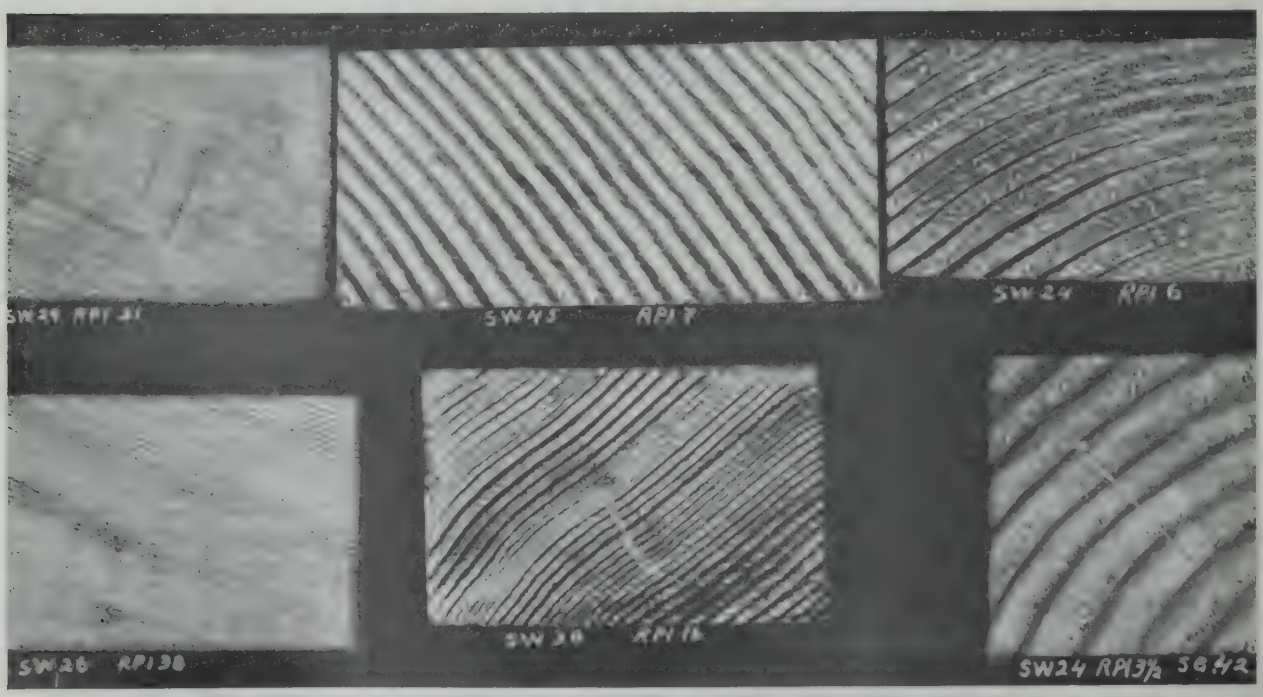
As the two structural grades, known as "Structural" and "Dense Structural" must be judged at the mill by competent inspectors before branding, and as the grades themselves meet the requirements of the American Railway Engineering Association, lumber manufacturers believe future buying and selling of railway lumber stocks will be made much simpler for railway purchasing and engineering departments, and for the mills which do the actual cutting. This opinion is based on the experience of other industries where a trade and grade marked article goes to the buyer carrying a definite value (such as strength, fineness, and other good qualities) established and backed up by the manufacturer.

Heretofore, in dealing with West Coast mills it has been the practice of many railroads to draw up their own standard requirements based on the timber experience of their own engineering departments, and on the data available through the technical studies made by the Forest Products Laboratory and other agencies such as the A. R. E. A. Naturally, interpretations of fact differ when viewed by many men so that the statement of requirements from two railroads for the same item, to be used in exactly the same way, often will require widely different cutting and grading at a Douglas fir mill.

Heavy demands have come to the Douglas fir lumber industry during recent years from the nation's railroads, and as one railroad followed another, first in search of a source of supply for difficult items and later for more general assortments of stocks, the many requirements have bothered the sawmill man, and word coming back to the industry does not always tell of satisfaction on the part of the railway engineering or purchasing departments. The grades and technical specifications on which this buying was done did not always suit the growth of the Douglas fir tree, and with the best intentions in the world the sawmill man could not do—with his species—what his buyer wanted.

Practically all the structural timber originally bought by the larger eastern and central states railways was on the basis of Southern pine, and many of the specifications on which important railroads buy Douglas fir today for both commercial and structural uses are the result of the particular railroad's experience with the structural timber and yard stock supply of the South. While such experience is valuable to be used where acquired, mill men of the West are convinced that specifying and buying of West Coast stocks should be on the nature of the timber available in that region, and not on the past experience of the particular railroad with any other species. In no other way, it is declared, can true economy result to buyer and manufacturer.

In justification of this position West Coast mill men point out that all of the socalled commercial grades, yard stock, dimension, finish, etc., are the result of manufacturing evolution. They are the manufacturer's effort to suit the customer's thought about appearance. So a grade is "clear" or "common" or some degree of one or the other on the basis of consumer demand, which is encouraged or discouraged by the "looks" of the piece of lumber, and on the natural peculiarities of the species



Cross Sections of Douglas Fir Pieces Showing Three Types of Structural Material. The Two Center Pieces Are Dense Structural Grade. The Poorest, From the Point of Strength, Are at the Right and Left. Samples on the Left Are Too Fine Grained and Those on the Right Are Too Coarse.

from which the lumber is taken.

If the trees of all softwood species were alike, standardization of yard stock grades would be simple. Species are not only different in cell arrangement, rate of growth, amount of heartwood, size and number of knots, etc., but trees of the same species of varying ages or from different soils and altitudes will produce, when manufactured, stock of considerable variation in appearance, and in adaptability for various uses.

Regional associations of lumber producers, with their national body and in cooperation with the central committee on lumber standards have worked long on the problem of grade standardization for the commercial grades of lumber. Sizes have been standardized, and grades names, and most of the larger producers throughout the country are now supplying regular standard items in the same sizes, regardless of species. Standardization of grades, however, to the extent of applying one grade to all species, is a long way off, excepting in the structural grades, where values of strength are rated with reference to the tested resistance of the clear wood of the same species, and strength governing factors have practically the same effect in all species.

Difficulties that stagger the forester, technologist and practical lumberman in trying to standardize commercial items of lumber made in many regions disappear at once when the problems of standardizing structural cuttings so that one species may be interchangeable with another is undertaken. Simplicity is traded for complexity because the reason for the grade, to determine strength values, may be submitted to the engineer and the wood technologist in the laboratory or on the job, and the findings or test results then may be incorporated into the grades themselves. Appearance of the piece, as a measure of good looks, has nothing to do with the structural grades but appearance as an evidence of straight grain, summerwood content, density, etc., which determine strength and durability, is all that is needed for a competent inspector to check the exact place in the structural equation belonging to the particular piece. General appearance and pleasing looks, smooth surface and lack of disfiguring blemishes cease to be of consequence; the inspector, following the rules established by the laboratory and job tests on similar material checks the known factors affecting strength, and rates the piece by the number of defects present and by their location. The result is a timber, or other cutting, of a definite strength value guaranteed not only by the mill but by the organized engineering brains of the country. It has met the tests. Guess work has been eliminated and such timbers, if grade marked as structurals, may be bought and sold with the same security that machine made or hand fabricated materials are accepted.

Engineers and architects have demanded certificates of strength with timbers, and it is on the basis

Man Seems Small and Insignificant Among Trees Like These, Giants of the West Coast Forests.

Douglas Fir Timbers 34 by 34 and 80 Feet Long, From the Largest Lumber Mill of the West Coast, Shipped to the Panama Canal Zone for Government Uses. These Are the Highest Structural Type.

of such particular use as men in these professions would make of structurals that the grades were developed by the United States Forest Products Laboratory in cooperation with various lumber and consumer organizations. In calculating the sizes of timbers necessary to support certain loads, as in a building, a bridge or in the framing of a freight car, the engineer applies different working stresses to the various species and grades of lumber. One species is naturally weaker, while another is stronger. Yet certain pieces from the weaker species may be stronger than other pieces from the stronger species. This would be for the reason that there is a considerable variation in strength between the strongest and the weakest pieces in any one species of timber.

Working stresses as applied by the engineer are measures of value usually expressed in pounds per square inch of cross section which indicate how much load the timbers will support with safety. These stresses have been determined as a result of a great many tests, and generally are accepted as correct. The working stresses recommended for Douglas fir of structural grade are one-third greater than those commonly given to No. 1 common, and for dense structural nearly half again as great.

The advantage of a supply of structural material one-third or one-half stronger is obvious, for one can figure on building stronger or larger without increasing the size of the timber used. Another advantage not seen so clearly at first is that one can build just as large or as strong as if using No. 1 common, with only two-thirds or three-fourths as much material. In timber sizes a 9 by 16 structural Douglas fir timber will carry the same load as the 12 by 16 No. 1 common of the same species. Being one-fourth lighter in weight such a timber will take but three-fourths the freight for transportation, and for the same reason it will lower, materially, the labor cost in placement on the job. As average freight and labor at the job usually will equal the original cost at the mill of a No. 1 common timber, the advantages to come from the more general use of structural timbers to engineers, architects, mills and purchasing departments of railroads are not difficult to calculate.

Careful western railroad buyers figure they can afford to pay up to twice the amount at the mill as is charged for No. 1 common to get structural material in any items where strength is the important factor. In this figuring they make allowance, as related in the foregoing, for less weight, smaller volume, ease of transportation at the job, etc. It is not necessary always to pay that much, but buyers should be willing to pay a reasonable premium per thousand because of the greater use value in the piece. The structural is harder to get; all mills cannot supply such cuttings, and where available special attention is required from log pond throughout the mill. The mill cutting structurals must slow down its normal production; its men must be better trained, and all processes must coordinate so that when manufactured the structural is just what the rules call for: a superior article of merchandise that will satisfy the needs of

And Just As the Camera Was Set Along Came the Customary Ford.

not only the buyer but of the user also.

With the adaptation of the structural grades, West Coast mills have made their first organized attempt in Douglas fir to segregate types of timber as the separation may affect strength. By practice and custom this has been the method in the South with mills cutting Southern pine for a generation. There timber and lumber are divided into two separate commodities: short leaf and long leaf. The division, commercially, is on the basis of rate of growth, as shown in the stock, summerwood content, etc., the same factors, subject to visual inspection, being used to distinguish the two pine classes that are allowed for in determining the structural grades in all other regions.

Douglas fir has been marketed very largely as of one timber type, when as a matter of fact it, too, may be separated into two distinct classes of material, each with characteristics similar to the two types of Southern Pine. In certain grading for industrial uses and for railroads where the buying is done on the density rule or in conformity with the structural grades, Douglas fir is sold as the equivalent, strength for strength, of the best long leaf pine.

A Straight Road Through Straight Trees, and a Bit of Sky.

For purposes of comparison, therefore, when a buyer wants anything from a 2 by 4 to a 40 by 40 in Douglas fir, and if he needs to have it "long leaf" in type he should order "Structural" Douglas fir. He will get, then, just what he expects in rate of growth, content of summerwood, straightness of grain, etc., that are the important factors in grading for strength.

In coming to the West Coast for structural material the buyer has four distinct advantages:

1. Strength equal to that of any other species.
2. Durability equal to that of any other species.
3. Larger and longer pieces containing more heartwood in Douglas fir than from any other species.
4. A greater volume of selected stocks, such as structural cuttings available today in Douglas fir than in any other species.

The establishing of grade marking for the structural grades of Douglas fir, backed by the publicity program of the West Coast manufacturers, is expected to turn the attention of engineering and purchasing departments to their timber opportunities with the mills of Washington and Oregon.

Large timbers and particular cuttings are becoming more difficult to get from other parts of the United States, as the virgin timber is being cut, and the more progressive mill men of the west are planning to supply grade for grade the most exacting requirements of railroads everywhere from the forests of Douglas fir.

Since 1900 railway taxes have increased 700 per cent—from less than $50,000,000 to approximately 400 million dollars.

Douglas Fir Log From a Puget Sound Plant. This Log Produced One Dredge Spud 40 by 40 and 70 Feet Long; Two Timbers 21 by 21, 70 Feet Long, and Nearly 10,000 Board Feet of Timbers and Lumber. The United States Government Bought the Spud.

But It Isn't a Castle

By Bert G. Mitchell

The central building in the picture might be taken for a castle in a royal park. It also has the appearance of a dignified university building fronting a beautiful campus. It happens to be neither. It is the railroad station at Reval, only the Estonians no longer call their capital by the name of Reval. Since 1918, when they became an independent republic, the people have called Reval by the Estonian name, Tallinn.

Another thing we do to Estonia is constantly to misspell the name of the country. Several high authorities in this country still print it "Esthonia" while the people in that country insist that the "h" must be left out.

Estonia is one of the Baltic states, formerly a part of the great Russian empire. On February 24, 1918, the former Russian province declared its independence and set up governmental housekeeping for itself.

Under the Russian regime the railroads belong to the state. Therefore Estonia fell heir to the 1,000 miles of railroads that traverse its lands. The Russians built this station in Russian style, and the Estonians are maintaining it in their own admirable manner.

In looking at the roof of the station a great many chimneys can be seen. This advertises the fact that central heating is not included in the station equipment. The building is heated with Russian stoves. This kind of stove is like a chimney built into the wall. In fact, such stoves frequently are built between two rooms or in a corner so that each one of three faces to the stove will come into a different room.

The stove is heated by filling the oven-like fire box with wood. This is allowed to burn down to glowing coals when the damper in the chimney is closed. The door to the stove is screwed shut so that there will be no draft. For 24 hours this stove radiates heat through its walls. At the end of this period another firing is necessary.

Railroad Station At Tallinn, or Reval, Estonia.

A peculiar thing happened to me one day in this station. Maybe "peculiar" isn't just the word. Perhaps I should have said "funny." I was planning to take a short trip on the train out of Tallinn. My train was to leave in a half hour. I thought I would buy my ticket so I could get a good seat on the usually crowded train. I stood in line with those who were buying tickets. When I had finally worked my way up to the window, I asked for a ticket, naming my station. The ticket seller politely informed me that the train for Narva was also on the track, and would leave in five minutes. He was sorry but he was not allowed to sell me a ticket for my train until the other had departed!

After five minutes the Narva train pulled out. I lined up again and was soon at the same window. It took just a second or two to get my ticket!

Conserving Human Capital

Pensions paid to retired employes by 135 Class I railroads of the United States in 1925 totaled more than 18½ million dollars, an increase of more than 1,100 per cent in the last 18 years.

In the five years from 1921 to 1925 the amount of pensions paid more than doubled. The average pension cost per employe rose from $1.56 in 1908 to $11.36 in 1925.

Pension costs are chargeable to the operating account of a railroad. They form one of the costs of providing transportation to the public. Here is a little table showing the development of the pension situation for the period 1908-1925 inclusive:

	Per Cent Increase
Number of roads paying pensions	85
Number of employes on these roads	70
Annual payroll	275
Average annual wage	122
Annual pension costs	1,135

It will be noted that yearly pension costs have increased far more rapidly than any other item. While there is no information available from the Interstate Commerce Commission reports regarding the number of railroad employes retired each year, or the number on pension rolls each year, this information was secured from other sources for seven Eastern railroads from 1908 to 1924. These seven roads show that the number on the pension roll increased from 3,963 in 1908 to 14,441 in 1924. Total pension costs on these seven roads increased from $981,601 to $6,881,613 during the 17-year period.

Excellent roads recently constructed by the government in the vicinity of St. John's, Newfoundland, are causing an increase in the use of automobiles.

An Electrified Line Saves Money

The Spanish Northern's Story

By A. I. Totten

General Electric Company

A SAVING of 55 per cent in the cost of electric power as compared with coal; a reduction of 47 per cent in the number of engine miles for the same traffic handled; a saving of 73½ per cent in the cost of repairs and upkeep for locomotives; a saving of 63 per cent in the cost of moving a ton-mile of freight, these are among the notable savings recorded by the recently electrified Spanish Northern Ry.

The traffic conditions of this railway include such difficulties as tunnels, one of them nearly two miles long, and a rise of elevation of 3,234 feet in 38.5 miles in the direction of load, with sharp curves and a single track operation. Nearly half of the total mileage, or 16.8 miles, is through tunnels.

The Spanish Northern Ry. has a single track line running from Gijon on the coast, south through Oviedo and Leon, joining the main line from Paris to Madrid at Venta de Banos. The limiting feature of the line is the section between Ujo, which is 816 feet above sea level, and Busdongo, which is just over the ridge on the southern slope of the mountains, which is 4,050 feet above sea level, a total distance of 38.5 miles. The longest tunnel, La Perruca, a short distance north of Busdongo, is on tangent track, and has a total length of 10,080 feet. The longest tunnel on the curved sections is El Orria, which is 3,475 feet long, and turns through about three-quarters of a complete circle.

This stretch of railway was built about 40 years ago under the direction of a prominent Spanish engineer. In Spain, as in Russia, the track gauge differs from that of neighboring counties. There it is 5 feet, 6 inches, while in France and the remainder of Europe the American standard of 4 feet, 8½ inches is almost commonly used.

The electrification was carried out by the Sociedad Iberica de Construcciones Electricas, the Spanish representative of the International General Electric Co. Power is purchased from the hydroelectric system of the Electrica de Viesgo Co. at 30,000 volts, 3 phase, 50 cycles. The energy is transmitted over the lines of the railway company to substations at Pajares and Cobertoria.

Electric Locomotive Hauling A Typical Freight Train Over Bridge Near Fierros, Spanish Northern Ry.

The daily schedule with steam operation consisted of 12 trains in each direction. With the substitution of 12 electric locomotives, 28 steam locomotives were released for other service. The locomotives which the General Electric Co. constructed for this service are of the swivel-equalizing-truck design and weigh 89.5 short tons, all on the driving axles. With this type of locomotive the pulling stresses are transmitted through the platform of the locomotives instead of through the truck frames as is the case with the articulated type.

View of Cobertoria Substation on the Spanish Northern Ry.

The cab is supported through center plates on two 3-axle trucks. Six motors geared one to each of the six driving axles give a total capacity of 1,550 horsepower. Hauling a 330-ton train up the 2 per cent grade at a speed of 21.7 miles an hour requires a tractive effort of 22,000 pounds. The balanced speed on level tangent track is approximately 30 miles an hour with a train of 1,655 short tons, while the maximum speed of the locomotive is 37.2 miles an hour.

The auxiliary apparatus and control mechanism are housed in a box type cab which extends the full length of the locomotive. The platform, built up of structural steel members securely braced and riveted, is covered by a steel floor ⅜ inch thick. At each end an operating compartment for the engineer is partitioned off from the apparatus room in the center. Current is collected by either of two slider type air raised gravity lowered pantographs mounted on the roof.

When descending grades the locomotive is held back by regeneration, five of the motors becoming generators while the sixth generates their exciting current. The locomotives are also equipped with vacuum brakes, but these are used only in emergencies and in bringing the train to a complete stop.

The normal train movement is "loaded" up grade, from Ujo to Busdongo, and "empty" down grade, although trains loaded to the rated capacity of the locomotive are also handled on the down grade. Favorable comments have been made by Spanish engineers on the easy riding qualities of the locomotives, the specifications of which are as follows:

Electrical

Nominal voltage system	3,000
Tractive effort, continuous	26,500 lbs.
Tractive effort, 1 hr. blown	27,100 lbs.
Tractive effort, 30% coef.	53,700 lbs.
Total horsepower, continuous	1550
Total horsepower, one hour	1550
Speed, continuous	21.9 M.P.H.
Speed, one hour	21.6 M.P.H.
Number of motors	6
Gear ratio	4:1 or 72:18

Mechanical

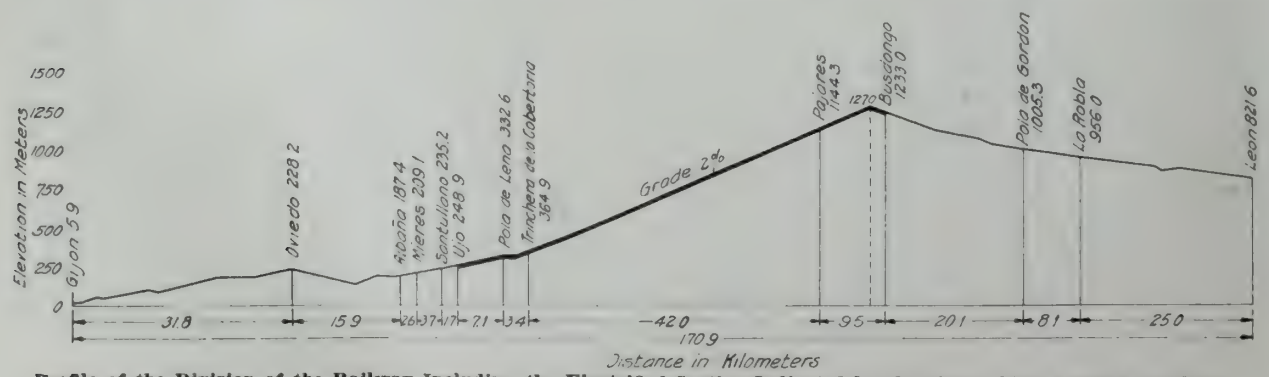
Track gauge	5 ft. 6 in.
Length	46 ft. 0 in.
Length	46 0 in.
Maximum rigid wheel base	11 ft. 6 in.
Diameter of drivers	39 ⅜ in.
Total wheel base	35 ft.
Number of driving axles	6
Height over trolley down	13 ft. 5 in.

Weights

Total weight on drivers	179,000 lbs.
Per driving axle	29,830 lbs.
Electrical equipment	85,000 lbs.
Mechanical equipment	94,000 lbs.

The control is electro-pneumatically operated, and is intended for non-automatic single unit operation. Fourteen steps are provided for acceleration with six motors in series, ten steps with two parallel groups of three in series, and 13 steps in regenerative braking. Regenerative braking is accomplished by the same controller, contractors and resistors as are used during motoring.

Power from the 30,000 volt lines is converted to 3,000 volts direct current in two substations,



Profile of the Division of the Railway Including the Electrified Section Indicated by the Heavy Line, Spanish Northern.

one of which is at Cobertoria, 5.9 miles from Ujo, and the other at Pajares which is the same distance from Busdongo, the southern end of the electric zone. Each of these stations contains two 3-unit, 4-bearing, 1,500 kilowatt, 3,000 volt direct current motor generator sets with the necessary transformers and switch gear. Provision is made for the future installation of a third unit in each station. The outgoing positive feeders are protected by high speed circuit breakers in each line.

The overhead construction is of the modified flexible catenary type, designed by the General Electric Co. and installed under the supervision of the Sociedad Iberica de Construcciones Electricas. This overhead is known as the twin catenary type and comprises two 4-0 copper wires flexibly suspended side by side from the same ½ inch diameter steel messenger by independent loop hangers. These supports are spaced 15 feet apart, and are alternately connected to each contact wire. Thus the distance between adjacent hangers is 7.5 feet.

Curve on Main Line, Showing Poles on Inside of Curve Supporting Feeders and Overhead.

With this construction, due to the four contacts secured by the double pan collected and the twin trolley wire, current is collected under all conditions without visible sparking. Porcelain insulation is used throughout. Steel poles spaced at intervals of 150 feet on tangent track, with reductions on curves, support the brackets carrying the messenger. Brackets on the poles carry the positive feeder and the negative return wire, while in tunnels, these are carried on iron bracket supports.

It is possible, because of the unusually circuitous route which the track follows, to improve the distribution by running the feeder across the ends of several loops that are necessary to conform to the limiting grade. One of these cut-offs is 1.24 miles in length across about 4.35 miles, while two others about 0.3 miles long join the ends of another loop of about the same length.

To protect the system, sectionalized construction is used. Because of the character of the country, mountains, curves and tunnels, and since there could be no interference with normal operation, all construction work was done at night.

A report recently issued by the management of the Spanish Northern Ry. Co. discloses unusually complete data on the results obtained by the electrification. All of the data on electric operation reverts to 1925, the first year in which the Pajares grade was operated wholly electrically. The data for steam operation is deducted from figures obtained during 1923. The changeover was made during 1924, so that during that

Steam Locomotive Formerly Used in Freight Service on the Spanish Northern.

year operations were partly steam and partly electric.

During 1925 the electric locomotives were operated 363,096 miles. Of this amount 302,886 miles represented the handling of trains, and the remainder switching and light engine movements. The traffic handled totaled 90,700,660 ton-miles in both directions. The consumption of electric power for hauling this traffic totaled 9,173,847 kilowatt hours delivered to the purchase point at Cobertoria by the power company.

In 1923, the period selected for comparison with the electric operation, the steam engines then in service were operated a total of 704,000 locomotive miles, while the traffic handled, 92,600,000 ton-miles, differed but slightly from that handled in 1925. The number of engine miles with electric operation was therefore only 51.6 per cent of that with steam operation while hauling nearly the same tonnage. This performance record was due to the greater capacity of the electric locomotive which permitted the hauling of trains up the practically continuous 2 per cent grade with single locomotives.

The table below shows clearly summaries of the cost of electric installation and of steam and electric operating costs.

The report calls attention to a numer of conditions which may affect any comparison that may be attempted between steam and electric operation. In the first place the cost of the installation was comparatively high since the equipment was purchased in 1920 when material prices were at the high peak. In the second place the price of electric energy during 1925 was not advantageous since the anticipated traffic did not materialize, and consequently the purchase of power was penalized to some extent by certain features of the power contract. Installation of the power limiting device, with the gradual increase in traffic, is expected to reduce the cost of energy approximately 20 per cent.

It is also regarded as of great importance that the use of electric locomotives permits handling nearly double the traffic which could have been handled with steam. A summation of the report gives the following direct advantages secured by electrification:

1—The substitution of 12 electric locomotives, having a weight of 1043 U. S. tons and a total continuous rating of 18,960 horsepower for 30 steam engines and tenders with a total operating weight of 2932 U. S. tons and with 29,590 horsepower.

2—A saving of 55 per cent in the cost of power required for operation.

3—A reduction in the engine miles by 47 per cent, which, taking into account the respective operating weights, represents a reduction of 83 per cent in the ton mileage of the motive equipment.

4—A saving of 73.5 per cent in the cost of repairs and upkeep for locomotives.

5—A saving of 63 per cent in crew expense.

6—A reduction of 31 per cent in the cost of moving a ton mile. The actual figures are 0.646 cents per ton mile for steam, and 0.436 cents per ton mile for electric operation. This decrease amounts to an overall saving of $182,000 in annual operation secured by electrification, after deducting the fixed charges on the cost.

In view of the conclusions reached, the Spanish Northern Ry. is now proposing the electrification of other difficult sections of its lines.

Cost of Electric Installation	
Contact lines, including electric material, rail bonds, poles, brackets and installation	$ 527,500
Transmission line, including electric material, steel poles and erection	38,900
Substations, including electric and auxiliary equipment, buildings and erection	457,000
Locomotives, including extra expenses	1,464,000
Power limiting device, material and erection	14,600
Total cost of electric installation	$2,502,000
Annual Expenses, Steam Operation	
Coal consumption	$ 310,000
Engine maintenance	131,500
Operating personnel	78,400
Total annual expenses for 1925	$519,900
Annual Expenses, Electric Operation	
Energy consumption	$140,000
Trolley lines, personnel and maintenance	12,000
Substations, personnel and maintenance	7,700
Locomotives, crew, repairs and maintenance	64,000
Total annual expenses	$223,700
Comparison of Steam and Electric Costs	
Total annual expenses, steam operation	$519,900
Total annual expenses, electric operation	223,700
Saving of electric over steam operation, annual	$296,200

Loyalty of Employes

One of the many reasons for the success with which American railroads have weathered unusually perplexing periods is the loyalty and intelligence of their personnel. It seems as if an unusually high percentage of railroad employes stick to their jobs through thick and thin. In railroad parlance we hear much of seniority, an almost sacred term to a railroad man. One's seniority or years of service coupled with a good record, is the open switch to a better comparative position with the railroad and a matter of just, personal pride.

Quite consistently, a railroad's personnel is built up from within, through the medium of men who have given years of time and service to their "road" and have made a higher grade through satisfactory performance. What an asset it has been and now is to American railroads that such a proportion of their employes are men of long-standing experience and training in that specific field.—Rochester (N. Y.) Gas and Electric News.

Try it, anyway. It doesn't hurt to say, "Thank you," and it does help. It may be a bit old-fashioned, but, like mothers and doughnuts and rocking chairs, it is one of the old-fashioned things which has withstood the test of time.

Aerial Passenger Traffic Is Growing

Flying Delivery Also

By W. H. Harper

RAILROAD executives are wise to watch carefully the commercial developments of aviation. Great things are being done, affecting the express company as well as the railroads. The parcels post was a severe blow to the express company. Now that branch of transportation has started its own air deliveries, but scarcely had its plans become public before competition appeared. A giant Ford trimotored transport, one of the largest types of airplane now built in America fitted as an aerial delivery truck, took off at the Ford airport at Detroit, one morning in August for Cleveland en route to New York for delivery to a typewriter company which will use it to deliver products to purchasers. The plane was the first freight carrier of its kind to be built for service outside the regular Ford air lines.

The plane will fly to New York on a test flight and from there to Hartford, Ct., where it will start on the first delivery trip to Havana, Cuba. The largest wholesale and retail cigar company in America already is delivering its goods throughout the country. The New Republic draws attention to the fact that more than 2,000 airplanes are in daily use in this country, of which one half are privately owned, and last year nearly 50 million miles were flown. Of this, about 50 per cent, or 23,310,000 miles, was done by non-military aviators. Contrary to popular impression, the air mail accounted for only a small part of this, 4,474,000 miles. The most important item was commercial flying of various sorts; taxi service, sightseeing, photography, crop-spraying, exhibition flights, etc.

The most important of existing airways is the New York-San Francisco line, by way of Chicago. There is a branch of this from Salt Lake to Los Angeles, and one from Elko, Nevada, to Pasco, Washington. Los Angeles and Seattle are connected by a line which passes through San Francisco. Radial routes go from Chicago to Dallas, St. Louis, Minneapolis, and Detroit, and there is a line from Boston to New York, which presently will be continued through Washington and Atlanta to Jacksonville and Miami. Several other short branch lines exist, and a number of additional routes are planned, including one from Minneapolis to Winnipeg and one from Boston to Cleveland via Buffalo.

For obvious reasons passenger business in the air will develop more slowly than other branches. At present the only lighted lines for night flying are New York to Salt Lake, New York to Boston, and Chicago to St. Louis. Passenger business between San Francisco and Chicago already is in operation, but the man who goes by air must be in a very great hurry. The ride for the transcontinental trip costs 15 cents a mile, or $400 for the flight. For much less than this amount you may cross the continent in the finest and fastest railroad trains, have a compartment or even a private room for yourself and wife—but you must go in one at a time, please—enjoy the best dining car service in the whole world at the most reasonable prices; have a bath in a tub at any hour, and have your clothes pressed while you sleep. For yourself there is a barber and for your wife a beauty specialist. You can do all these things, you and your wife, stay at the best hotels and return home at the end of the week or ten days with money in your pockets, if you aren't too dreadfully extravagant, and not spend

—Wide World Photo

Aerial Truck Delivers Six Typewriters Without Landing; and They Weren't Damaged.

$400 for the entire disturbance. Of course if you are in a great hurry you can cross the continent by air, but you'll miss the bath and the other comforts.

Aviation is growing daily in popularity, safety and comfort, but it will be many a day before that industry seriously injures the railroads. Once in a while we have a railroad wreck, it is true, and passengers are messed up in a distressing way, but F. S. McGinnis, one of the live agents of the Southern Pacific, draws attention to the fact that in travel safety American railroads continue to lead all forms of transportation, including aviation, motoring, and plain everyday walking. Figures just published by the naval bureau of aeronautics show that during the last ten months naval aviators flew 84,478 hours in the air with but six fatalities. As the average flying speed is 100 miles an hour, there was but one fatality to each 324,000 miles flown, a distance equivalent to 13½ times around the earth. Compared with this, statistics for 41 months ending May 31, 1927, indicate that a traveler might journey the equivalent of 193,091 times around the world on the Southern Pacific's steam trains without danger of being killed. From January 1, 1924, to May 31, 1927, the company's steam passenger trains safely carried more than 38,905,000 passengers and operated a total distance of approximately 63,992,000 miles, a service equivalent to carrying one passenger more than 4,653,780,000 miles.

"But," says Mr. McGinnis, "as there has been not one passenger fatality due to accident to our steam trains in nearly eight years it can be said that a passenger might travel well over 400,000 times the distance around the world without meeting with a fatal accident."

The World's First Flying Orchestra Photographed at Curtiss Field, New York, Just Before Starting An Air Tour of the United States. Lieutenant Lowell, Former Army Pilot, Directs the Flying Activities.

Chicago's Great Airport

Chicago's municipal airport is another example of progress in the right direction. This city has laid out a great airport with an eight-direction runway system, complete night lighting, spacious hangars and other necessary equipment.

These are only a few typical cases. Other cities are pushing ahead with construction, or have voted funds for this work. Schnectady has a commercial airport in which $120,500 worth of stock has been sold. Baltimore has voted $1,500,000 for a municipal airport. San Diego has been authorized to establish a large airport for both land and seaplanes. Kansas City has just voted a modern airport within five minutes of the center of the city.

Along the Chicago-Dallas route, Moline, St. Joseph, Wichita, Oklahoma City, Ponca City, Tulsa, Fort Worth and Dallas have improved their fields and installed night lighting. This is an addition to the department of commerce lighting program, which calls for the lighting and marking of intermediate fields along airways between cities. Not including the 92 fields taken over from the post office, 32 of such fields have been established the past year, 80 more will be added by November and 58 by June 30, 1928. In addition, beacon lights have been placed on five airways, and are being installed on seven others. These intermediate fields, placed possibly 30 miles apart and lighted from dark until dawn, are used by mail pilots and others flying over the airways, in case of inclement weather, forced landings, or, in necessity, for temporary stops.

Mexican Air Mail

The Mexican government has decided that the aerial postal service between the United States and the Mexican capital should be via Matamoras because it is the shortest route and the aviators, following the lowlands, can arrive at the Mexican capital without the danger of crossing many ranges of mountains and other obstructions. Besides, the aviators will have an unobstructed course at a much lower altitude than via Laredo or El Paso, both of which cities have, it is said, made representations in favor of having the aerial line pass through them.

Matamoras, anxious to get the aerial post line, has offered through its chamber of commerce to give, free of cost, grounds for an aviation field near the city. The Mexican government is said to be waiting for the request from the

American aerial service through diplomatic channels, to present its views in favor of having the line pass through Matamoras.

Air Liner for 100 Passengers

A forerunner of the giant air liners of the future is now under construction at Friederichshafen, Germany, in the factory of Dornier Metall Bauten Co., it is announced by Frederick Verville, American representative of the Dornier company.

This new air liner, which may fly the Atlantic next spring, will carry 100 passengers and baggage. Its motor unit will represent 7000 horsepower. It will be an all-metal flying boat and fully loaded will weigh 50 tons. Verville said that he was not at liberty to divulge blue print details of the giant German air liner, but from an authoritative source it was learned that the preliminary plans for the plane, made some time ago, called for 12 motors of approximately 500 horsepower arranged in tandem units. The hull for the gigantic metal bird has been laid and construction work has been under way some time, Verville said.

The theory of construction of the giant air liner is said to permit from 20,000 to 30,000 pounds of useful load. On the basis of 100 passengers it was stated that 200 pounds would be allowed to each passenger with baggage. In the case of a long flight such as crossing the Atlantic the passenger list might be cut somewhat to allow for a larger pay load in the matter of fuel.

The Air Mail Increases

In a recent statement Postmaster New showed that in May 46,133 pounds of mail were carried by the 12 contract air mail routes of this country. In June this total was increased to 55,026 pounds and in July the total was 53,521 pounds. The fact that there were fewer business days in July than in June accounted for the apparent falling off in postal business.

The seven air mail routes operating from the far-famed airport of Le Bourget, France, carried less than 800 pounds of air mail during March, and for April, the last month for which figures were available, these seven routes carried 1282 pounds. In contrast to these figures Los Angeles handled over the Western Air Express line alone an average of 16,500 pounds during May, June and July.

An analysis of the figures made by Second Assistant Postmaster-General Glover shows that of the total air mail handled in the United States on the 12 contract routes, the Western Air Express carried practically one-third. During May the Western Air Express carried 15,213 out of a total of 46,133 pounds, in June this line handled 17,120 out of a total of 55,026 pounds, and in July 17,390 pounds out of a total of 53,521 pounds.

The second largest air mail route in the United States is the National Air Transport Line operating between Chicago, Kansas City and Dallas, which handled 9460 pounds in May, 10,542 pounds in June, and 9499 pounds in July. The third largest route is that of the Pacific Air Transport from Los Angeles to Seattle, which handled 5325, 6131 and 6708

P. & A. Photo.

When the Air Express Arrives at Malmo, Sweden, From London and Paris.

pounds respectively in May, June and July.

Not only are the air mail contractors excelling their European rivals by a large margin in the total mail carried, but they are setting an enviable record for efficiency. During July six of the 12 air mail routes operated with 100 per cent efficiency, while the Los Angeles-Salt Lake City line, which is the banner performer of all, has an average of only a fraction of 1 per cent less than a perfect record for its entire 15 months of operation during which the Western airplanes have flown more than 600,000 miles without accident.

Baldwin Dirigible at St. Louis in 1904. The First Craft in the United States to Make a Controlled Flight Over a Prescribed Course.

The Dream of Octave Chanute

By C. P. Philbrick

Reading in the Los Angeles Sunday Times of July 10 that versatile writer, John Steven McGroarty's report of picking up a strolling prophet by the wayside while motoring over a California highway, who suggested the time was not far distant when we shall cease to boil water in a big kettle and drag tonnage over the ground, recalls to memory having heard much the same prediction made by Colonel Octave Chanute in 1870.

I was then with a party of engineers during the construction of the Atchison & Nebraska R. R., now a part of the Burlington System, and Colonel Chanute visited us at Table Rock, Nebraska, as consulting engineer of the "Joy Roads." He was then known to be an advanced dreamer of aerial navigation, and had been experimenting with gliders. No self propelling airship, however, had been developed. After supper, seated on the porch of the Abell House, Colonel Chanute entertained our party with his ideas, the results of some of his experiments, and the possibilities of the future development of aerial navigation. Some of his suggestions were much akin to those offered recently by Mr. McGroarty's prophet.

A short time previously some eminent professor of an eastern university had addressed a body of scientists in New York City, and demonstrated beyond question, that no machine could ever be constructed that would lift its own weight, unaided by a gas lighter than air, and likened it to the effort of a man trying to lift himself by the straps of his boots. One of the listeners mentioned the circumstance. The Colonel smiled serenely and said, "Professor—is a wise gentleman, but he will be wiser if he lives a few years longer."

All of his audience paid respectful attention to his talk, but after he had retired the chief of our party said, "It is regrettable that so distinguished an engineer as Colonel Chanute should become 'nutty' over the 'Darius Green' chimera."

The Colonel had remarked at the close of his discourse that "almost everything is attainable if we only know how." The following day while out in the field, I noticed him standing on high ground watching through his binoculars a big hawk that was soaring around in the air, and I thought to myself: "The Colonel is learning how." Shortly after, an article appeared in one of our magazines, contributed by Octave Chanute in which it was stated that the wings of an airplane should present a concave surface rather than a convex, as was then being experimented with, in the air to insure stability.

Perhaps some modern Sir Isaac Newton may nod and dream under an appletree, and taking up the thread of that philosopher's thought, discover a hidden counter-active force to the attraction of gravitation, that may repel from rather than attract toward Mother Earth, and that will enable me to step upon an automatic scales platform, drop my penny, and receive a ticket reading "22" instead of "220." I am certain that I should obtain such a result if I only knew how. When such a discovery has been attained our air trains will handle full tonnage easily, won't they?

An Air Diner

A complete dining service, including a six-course chicken dinner, has just been started on airplanes of the Colonial Air Transport Co., flying between New York and Boston. The food is taken aboard in containers and kept warm on electric heaters.

The first Paris-London regular airplane equipped for dining service took off at Le Bourget one day in August for Croydon, Eng. It carried ten passengers, a pilot, mechanic, wireless operator, cook and waiter, making 15 persons in all. The luncheon menu resembled that of a Paris restaurant, hot and cold dishes being served.

At Five O'Clock in the Morning

The Dining Car Man Goes Shopping

By W. G. Kelly
Statistician, Southern Pacific

This Smile, With Much Superior Ability, Made Otto Paul Reis Supervising Chef of the Whole Southern Pacific Dining Car Service.

FEW PERSONS realize the tremendous tasks involved in supplying adequately maintained dining car service on a great railroad. Supplies of a perishable nature must be purchased, delivered and used within the shortest period of time, as its nature will not permit of storage. It is quite different from the problem involved in supplying material for other departments of a railroad, such as car wheels, cross ties and so forth.

Quality is the prime consideration in every purchase, price taking second place. All articles must be of high standard and pass rigid tests as to quality in every respect, in order that the high standard of service may be maintained.

Supplies are purchased by specialists and, as a double check, the goods are closely examined as to quality and quantity when delivered to our commissaries.

As an example of the importance attached to high standards, eggs are obtained only from ranches which are frequently inspected and where the stock is fed on specified rations. Milk and cream is obtained only from dairies which have selected herds of cattle under strict government inspection.

We have four men who devote their time to the buying of supplies, and these men are experts in their line of work. The wholesale fruit and vegetable markets are visited every morning between four and five o'clock in order that the very best produce may be selected for our patrons. Supplies start to reach these markets from the farms in the early hours of the morning and the first men on hand obtain the choicest selections. The buyers also visit the packing houses daily and personally select meats for our use. In the purchase of dry groceries, etc., the same care is used to secure only the best that may be obtained.

The market price of various perishable supplies, particularly fruits and vegetables, shows great variation as to locality and time. In order to purchase to the best advantage financially each of our buyers renders a daily price list and exchanges the list with the other buyers. In this way we are enabled to purchase when the price is most favorable. For instance, if strawberries of suitable quality were available in San Francisco market at a figure lower than at

other localities, this commodity would be purchased in San Francisco.

Great study is required in the matter of market conditions. We are continually faced with the possibility of market shortage of various commodities, and these conditions must be anticipated in order to prevent the necessity of paying an excessive price. Take in the case of potatoes, the conditions throughout the country affecting this article are studied, and if indications point to a possible scarcity, they are purchased in large quantities and kept in storage to carry us through the period of emergency. Weekly tests as to quality of eggs, milk and cream are made for the Southern Pacific Co. by the department of nutrition of the University of California. You no doubt have all heard the story of the owner of a cold storage plant who, when asked what became of the idea of stamping the date on each egg, made the reply that the date faded after a period of seven or eight years (Laughter). Such eggs would hardly pass for our use, as we will not accept them if they are more than a few days old. At the university the eggs are candled to reveal the condition of the whites and yolks. The age of the eggs is determined through a very ingenious method which was evolved through experiments. It was found that air enters the egg through the shell, which is porous, and that the air space in the egg increases in direct proportion to its age. These eggs are also tested as to the ability of the yolks and whites to hold together.

Samples of milk and cream are also sent to the university weekly for test as to butterfat content and purity. The state requirement for cream is 18 per cent butterfat content, but we will not accept any with less than 24 per cent. Through these tests we are enabled to maintain the very highest standard for these important articles of food.

Our cream is placed in sealed cans at the dairies and kept under refrigeration from that time until issued to the patron. This has resulted in the elimination of waste through spoilage, as it will keep indefinitely if properly refrigerated and the quality is unimpaired.

It takes practically the whole world to supply the demands of the dining car. Our linen is specially manufactured for us in Ireland. Crockery is obtained from Germany as well as in the United States. Italy supplies olive oil. Japan sends the rice; Brazil contributes bananas, and so on.

In order that we may offer our patrons fruits and vegetables over a long period, advantage is taken of all the markets in the West. We start purchasing various commodities in the localities which present the earliest market for suitable supplies. As examples of this feature, we obtain canteloupes from the Imperial Valley beginning June 1. About the middle of July they come from the Turlock district in California. The supply from this district is exhausted in the latter part of September. From August to October, the most suitable supply is obtained from the Fallon district in Nevada.

Through this system of purchasing we are able to spread the use of this commodity over a period of five months. In a similar manner we are able to obtain lettuce during the entire year, the first supply being available from the Imperial Valley and Arizona, and during the latter part of the year from the Watsonville district in California. Tomatoes are first found in Mexico, beginning with January. About the first of April we begin buying them in southern California, and after July the best supply is available from central California.

It will be interesting to some of you to know the quantity of supplies necessary to feed the traveling public on a railroad such as the Southern Pacific. Here are a few of the main items:

We use every day 850 doz. eggs; 2150 lbs. of beef; 640 lbs. lamb; 694 lbs. pork; 750 lbs. poultry; 685 lbs. fish; 825 lbs. ham and bacon; 710 lbs. butter; 530 gals. of milk; 570 lbs. coffee; 2520 lbs. of potatoes; 1800 lbs. flour; vegetables, not including potatoes, 5750 lbs.; sugar 1900 lbs. You will gain from this some idea of the size of our daily market basket.

It will be well to mention here a new feature established last year on our dining cars. This consists of the serving of "Baby Beef," a new product in California. An association was formed last year to produce this commodity. The beef is obtained from animals with an average age of a little less than one year. The stock is placed on a special diet resulting in a meat far surpassing any heretofore produced in California. We buy all the market affords, and at prices ranging from three to four cents a pound higher than the price of regular beef.

We maintain kitchens at our various commissaries, the purpose being to lighten the work of the cooks on the road, and also to produce articles of uniform quality. Our largest kitchen is in San Francisco. It turns out daily 1500 pounds of blended flour of various kinds, such as hot cake blend, biscuit blend, cornbread blend, and among other things, 253 dozen doughnuts every day, 200 loaves of bread, 300 pies, and 855 cuts of coffee cake.

(This kitchen and its products were described at length in this magazine last June.)

The public, of course, has no idea of the tremendous expense of preparing the dining car meals. This is due, naturally, to the conditions under which a dining car must operate. Prices must be popular and yet the service must be equal in standard to that offered by the highest class hotels. As instances of the high cost, I shall call your attention to the expense of keeping all of the food supplies of the dining car under proper re-

frigeration. Unlike a hotel where perishable supplies may be kept under refrigeration in one or two ice boxes, it is necessary to maintain refrigeration in at least five different places on a dining car, due to lack of space. This requires great quantities of ice. Crossing the desert in warm weather, the meltage often is 2,000 pounds a day to the car. The cost of wages is high due to cramped quarters, and the necessity of handling a large number of persons in a short time. The breakage of dishes is very great. Approximately 1,000 dishes must be washed during a meal period by one man in a sink less than two feet square. The speed necessary to move these dishes results in heavy breakage, and the motion of the train adds its share to the damage. The following figures indicate roughly the average receipts and expenses per each meal served:

Average receipts	95 cents
Expenses:	
Food	46 cents
Wages	44 cents
Fuel, ice and water	6 cents
Crockery, glassware breakage	2 cents
Laundry and upkeep of linen	6 cents
Other expenses	16 cents
Total commissary expense	$1.20
Net loss per meal	25 cents

The figures quoted do not include car repairs or other strictly car expenses. It will be readily seen that the company spends a great deal of money in caring for its guests.

An Early Morning Lesson in Table Service.

I should like to mention how our department copes with such an emergency as a big convention movement. These conventions invariably are held at a time of year when travel is highest and the dining cars are taxed to capacity. During a recent convention our department was required to serve 56,000 extra meals in ten days. This involved 105 distinct special dining car trips, and yet not a single failure was noted in any detail of service, and all patrons received the usual courteous service.

What a Pleasure It is On a Railroad Journey to Enter a Dining Car Efficiently Operated by Courteous Employes! Poor Service Would Ruin the Day.

Nearly 3000 Miles For This Mikado

Frisco engine 4100, a coal burner, left Kansas City, at 6:15 p. m., destined to Birmingham, a distance of 735 miles, pulling a freight train. August 4, at 1:00 a. m., the fire in this engine was knocked for the first time since it left Kansas City July 25, after completing two round trips, a total of 2940 miles. A careful check of existing records made by the motive power department of the Frisco reveals no similar records made by coal burning locomotives.

H. L. Worman, superintendent of motive power, says the performance of the 4100 is a distinct advance in railroading in several respects. "This will be better understood," said he, "when you remember that the average freight locomotive run in America is from 200 to 300 miles. At the conclusion of that much mileage the locomotive usually is taken to the enginehouse to have its fire knocked.

Frisco Engine 4100 Photographed After Completing the 2,940 Mile Run Without Knocking Its Fires.

"Engine 4100 made almost 3000 miles before its fires were knocked. Such a run means a great reduction in fuel, since fuel is lost when fires are knocked and engines changed on trains. The run means that we shall need fewer engines for freight service, and it means that transportation over our lines will be highly expedited. We are greatly elated over the results of this test."

The official report shows that no special attention was given engine 4100 before its 2940 mile run was made, and no special crews were used. At no time was there any indication of the engine raising water and when the plugs were removed at Kansas City upon completion of the remarkable run there was no sign of mud in the leg of the boiler. Only an average of 12 minutes was consumed at each intermediate terminal in shaking the fire and cleaning the ashpan. Alabama mine run coal was used on the trips with the exception of Oklahoma coal on two subdivisions, and a total of 281 tons of coal was burned. The engine handled a total of 5,533,121 gross ton miles, which shows 101.6 pounds per 1000 gross ton miles. No special allowance of oil was used, and the lubrication of the engine was perfect.

Engine 4100 is a giant of locomotive power and is known as the Mikado type, tonnage class 63. Cylinder dimensions are 27 in. by 32 in.—63 in. driver, 200 pounds steam pressure. The capacity of its tank is 20 tons of coal; 11,700 gallons of water. The engine weight on trucks in 25,870 pounds; weight on trailers 49,820 pounds; on drivers 244,690 pounds, total weight of engine 320,280 pounds; weight of engine and tank 560,880 pounds. This engine is equipped with syphon, brick arch, table grates with 35 per cent opening, with 70.3 square feet of grate area. It has a 6¾ in. nozzle; 7 rows of brick in arch, and arch down to flue shoot, and is equipped with modern stoker and booster.

On arrival at Kansas City at 4:30 a. m., July 30, on completion of the first round trip, the fire was banked, using 870 pounds until 6:00 a. m. that morning. On arrival at Birmingham at 9:35 a. m., August 1, after return to that city on first leg of the second round trip, the fire was banked with 71 scoops of coal, or 1065 pounds, until 4:00 a. m., August 2. A total of 3,258 pounds of coal was used in banking the fires at Birmingham and Kansas City.

Examination of the engine upon its return to Kansas City, August 4, found it in excellent condition. The fire was knocked and the following conditions were found: 7 small and two large flues stopped up on left side; 4 small and 2 large flues stopped up on right side; 2 inches of dirt on top of arch; 2 bushels of dust and honeycomb in combustion chamber; grates in good condition; 4 scoops of ashes in front end. This engine operated over six subdivisions where the grade line is from level to 1.67 per cent.

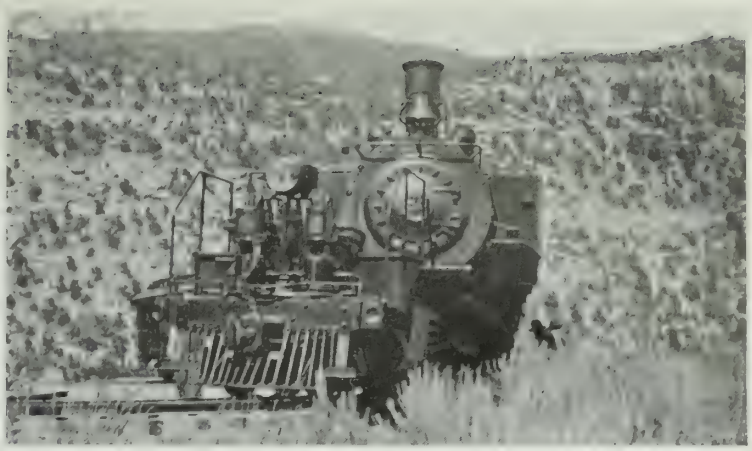
The analysis of water from gauge cock at completion of the 2,940 miles in parts per 100,000 was as follows:

Total dissolved solids...	136.0
Total hardness	0.7
Total alkalinity	40.0
Total soda ash	39.3
Percent of soda ash to dissolved solids	28.9

The average speed maintained by the engine during its run was 19.3 miles an hour.

Sixty-Six Degrees Around A Curve

By Harvey Wells



The New Articulated Locomotive on the 66-Degree Curve and 7½ Per Cent Grade at Moro Castle.

A GOOD bit of interest has been shown recently in the Uintah Railway. This has manifested itself among railroad men, many of whom haven't the remotest idea about where the road is situated. The subject is timely and filled with worth-while information for men interested in operating or mechanical matters.

The Uintah Railway, says Baldwin Locomotives, a magazine, is a line of three feet gauge, extending in a northerly direction from Mack, Colorado, a point on the Denver & Rio Grande Western R. R., to Watson and Rainbow, Utah, a distance of 63 and 70 miles respectively.

The road was built in 1904 to transport a form of asphalt commercially known as "gilsonite," mined in the vicinity of the Uintah Mountains in Utah. Gilsonite is extensively used in making paints, varnishes and insulating material, and in prepared roofings and floor coverings. It is a hydro-carbon in character, brittle in structure, intensely black, and of the specific gravity of water. In the United States its occurrence is confined almost entirely to the Uintah Basin.

The chief problem in building the Uintah Railway was to cross the Roan or Book Plateau, a high ridge separating the valley of the Colorado River on the south, in which Mack is situated, and the Uintah Basin lying to the north. This ridge is crossed at Baxter Pass at a maximum elevation of 8437 feet above sea level, or about 3900 feet above Mack. From Mack to Atchee, Colorado, where the shops of the railway are situated, the distance is 28.3 miles and the rise in elevation 1884 feet. The steepest grade on this section of the line is 2.90 per cent. From Atchee to Baxter Pass at the summit, a distance of 5.9 miles, the total rise is 2012 feet, and the grade for the greater part of the distance 7.5 per cent. The line descends thence to Wendella, a distance of 6.7 miles, on an almost continuous grade of 5.0 per cent. Continuing from Wendella to Watson, 62.8 miles from Mack, the grade is descending, and varies between the limits of 1.10 and 3.34 per cent.

The Curve at Thimble Rock.

In 12 miles, which includes the steepest grades on the line, there are 233 curves, varying from 4 to 66 degrees. The grades are compensated, and on the 66-degree curves the rails are spread ⅞-inch. The greater part of the line is laid with rails weighing 60 pounds to the yard.

The Uintah Railway is a common carrier, handling both freight and passenger traffic. Representatives of the Interstate Commerce Commission, who visited the property in July, 1924, pronounced it the most difficult operating proposition they had ever seen. The motive power, previous to July, 1926, consisted of six geared and seven direct connected locomotives. Of the latter, two are of the 0-6-2 type with side tanks and are used chiefly in passenger service; while three are of the Consolidation (2-8-0) type, and two of the Mikado (2-8-2) type, for freight service. The geared locomotives handle freight traffic over the steep grades between Atchee and Wendella, while the Consolidation and Mikado type locomotives handle these trains on the lighter grades. Each passenger locomotive can haul one coach, weighing 35 tons,

over the 7½ per cent grade without assistance.

In July, 1926, The Baldwin Locomotive Works delivered to the Uintah Railway a high pressure articulated locomotive of the 2-6-6-2 type, which represented a great increase in hauling capacity over any locomotive previously used on the line. It was largely due to the foresight and wide experience of Mr. L. C. Sprague, General Manager of the Uintah Railway, that this locomotive was purchased, as it was a rather bold experiment in view of the unusual conditions which the engine was expected to meet. The results so far have entirely justified the step.

Moro Castle Curve, One Mile from Atchee; 66 Degrees on a Grade of 7½ Per Cent.

This locomotive develops a tractive force of 42,100 pounds; and with 194,500 pounds on driving wheels, the ratio of adhesion is 4.62. The average load per driving axle is approximately 32,400 pounds; and 82 per cent of the total weight, including the supply of fuel and water, is carried on the drivers.

In view of the excessive curvature on the line, the design of the running gear of this locomotive was given most careful consideration. The arrangement of the frames is in all respects similar to that used on Baldwin Mallet compound locomotives. The radius bar connecting the front and rear frames is attached to the former by a horizontal pin, and at its rear end has a ball jointed connection with a vertical pin which is seated in the back cylinder saddle. This construction provides ample flexibility in both a horizontal and vertical direction.

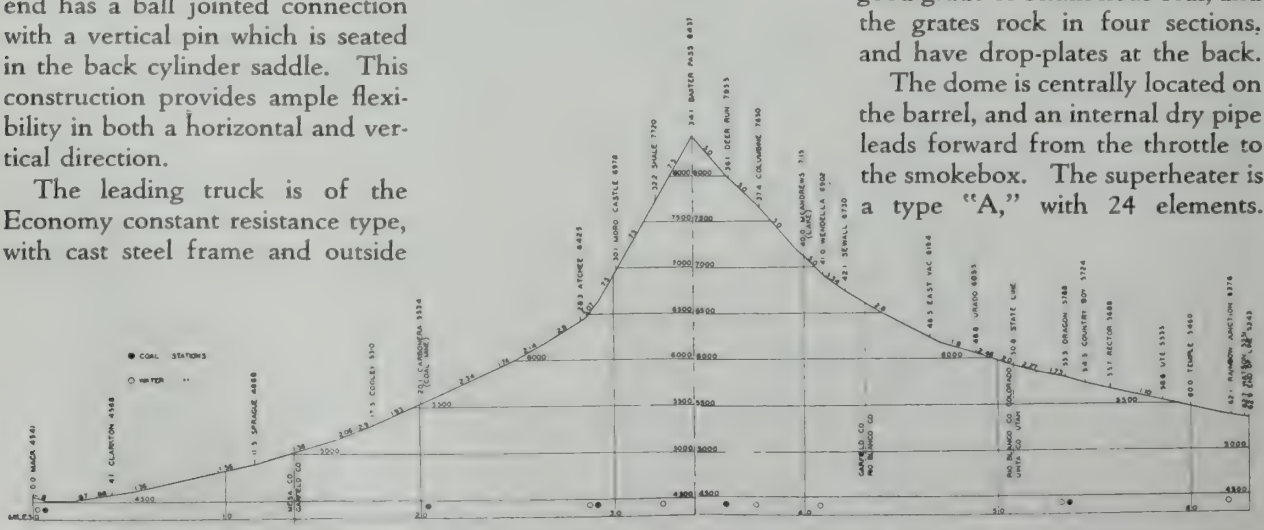
The leading truck is of the Economy constant resistance type, with cast steel frame and outside journals. The load carried by the forward equalizer is transferred to the truck frame through a single rocker placed on the center line. This truck is designed to swing 6¾ inches on each side, and is equalized with the driving wheels of the front unit.

The back truck is of the Delta type and is equalized with the rear group of drivers. The locomotive frames are supported on the truck frame through two constant resistance rockers, whose centers are 9 feet 6 inches apart transversely. There is practically no overhang at the rear end, so that, while ample flexibility is provided, the frames are very stably supported. The driving wheels of the middle pair in each group have plain tires.

The boiler is supported on the front frames by a single sliding bearing placed between the second and third pairs of driving wheels, and designed to permit a rocking movement in a vertical plane. There is a rigid support at the cylinder saddle of the rear engine, and the firebox is supported on sliding shoes at the front and back.

The boiler itself requires no special comment. It is of the straight-top type, with a sloping back head and roof sheet. The firebox extends over the rear driving wheels and contains a Gaines bridge wall. The fuel used is a good grade of bituminous coal, and the grates rock in four sections, and have drop-plates at the back.

The dome is centrally located on the barrel, and an internal dry pipe leads forward from the throttle to the smokebox. The superheater is a type "A," with 24 elements.



Profile of the Uintah Railway. Rainbow is at the Terminus of a Branch which Leaves the Main line at Rainbow Junction. Grades are Given in Per Cent. and Elevations at Stations, and Distances From Mack, are Noted.

Live steam is conveyed from the header to the rear cylinders through two external pipes which pass out through the top of the smokebox, and are heavily lagged. Just above the steam chest these pipes branch, and the branches unite in a single flexible pipe placed on the center line, which conveys live steam to the cylinders of the front unit. The exhaust from the rear cylinders is conveyed forward to the smokebox through external, rigid pipes; while the exhaust from the front cylinders passes through a flexible pipe, which is placed on the center line. The nozzle in the smokebox has a central circular tip through which the front exhaust is discharged, and two semi-annular tips for the exhaust from the rear engine.

Loading Ores at Hell's Hole.

The steam distribution to all the cylinders is controlled by 8-inch piston valves, which are set with a travel of 5 inches and a lead of ⅛-inch. The steam lap is 13/16-inch, and the exhaust lap zero.

The valve gears are of the Walschaerts type, and are controlled by a power reverse mechanism. The front and back reverse shafts are connected by a jointed reach rod, which is placed on the center line of the locomotive.

The boiler is fed by one non-lifting and one exhaust steam injector, the latter being placed on the right-hand side and receiving its steam supply from the exhaust of the rear cylinders. The fuel supply is carried in a box placed back of the cab, and the water in two rectangular side tanks, which are placed as low as possible. The tanks are connected by a transverse equalizing pipe, placed at approximately mid-length. The rear end of the locomotive is so constructed that a separate tender can subsequently be used, should this prove desirable.

Combined automatic and straight air brakes are applied to all the driving wheels, and the Le Chatelier brake is applied to the cylinders of the rear engine. Air is supplied by two 9½-inch pumps which are mounted on the forward deck plate; and there are two air-drums, placed right and left on top of the water tanks.

Sand is delivered in front of the leading drivers from a rectangular sandbox placed on the forward deck plate; while a box placed over the boiler supplies sand to the front and rear drivers of the back engine.

Each unit is equipped with a mechanical force feed lubricator, having four feeds which lead to the cylinders and steam chests. The air pump cylinders are lubricated by a single-feed bull's eye lubricator.

Owing to the swing of the front cylinders when traversing sharp curves, it was found impracticable to apply a manually operated cylinder cock rigging; and the cylinder cocks, therefore, are operated by air.

This locomotive has a height over all of 14 feet 2½ inches, and an extreme width of 10 feet 1 inch; while the length over the outside faces of the front and rear bump-

Left Hand View of the New Articulated Locomotive Built by the Baldwins for the Uintah Railway Company.

ers, is 45 feet 8 inches. These are very liberal dimensions for a locomotive of only three feet gauge, but in service the locomotive has proved more stable on the track than any of the smaller locomotives in use on the road.

The new locomotive is at present operating on the northern section of the line, between Baxter Pass, at the summit of the Book Plateau, and the mines in the vicinity of Watson. The locomotive hauls cars loaded with gilsonite from Thimble Rock mines to Rainbow, a distance of about two miles, where they are assembled into trains for movement over the mountain. Conditions at Thimble Rock mines are particularly difficult owing to the combination of 7.5 per cent grades and 66 degree curves, and the short haul work here was formerly done by the light tank locomotives of the 0-6-2 type.

From Wendella to Baxter Pass, on the ascending grade of 5 per cent, the new locomotive handles as much tonnage per train as two of the geared locomotives, and makes the run in a little more than half the time. While it is as yet too early to quote exact figures, it is evident that this represents a great reduction in the operating expense per train mile, as well as a reduction in overtime and a considerable increase in the track capacity of the line. Furthermore, it is expected that the maintenance expense of this locomotive will be less than that of one geared unit.

The locomotive has fully demonstrated that it can be safely operated on the severe grades and curves between Atchee and Baxter Pass on the south side of the mountain, showing the same increase in speed and hauling capacity as on the north side. In fact, the management of the railway has in view the eventual replacing of practically all the older locomotives, both geared and direct connected, with locomotives of the articulated type.

The tonnage rating of the new locomotive on various sections of the line is as follows:

Location	Maximum Grade Per Cent	Tonnage
Mack to Atchee	2.9	525
Atchee to Baxter Pass	7.5	145
Watson to Dragon	1.10	1150
Dragon to Wendella	3.34	525
Wendella to Baxter Pass	5.0	240

These tonnages are approximately double those assigned to the heaviest geared locomotive, and 75 per cent in excess of those assigned to the heaviest direct connected, non-articulated locomotive, which is of the Mikado (2-8-2) type.

The experience of the Uintah Railway is confirming that of a number of logging roads in the Northwest, where, in spite of exceptionally difficult operating conditions, direct connected articulated locomotives, suitably designed and intelligently handled, are proving the most efficient type of motive power on their respective lines.

He Who Hesitates Is Safe

Nearly 2,500 motorists lost their lives, last year, at railroad crossings while 6,991 were injured, according to a compilation given out recently by a railway committee. In 1898, when travel was slow by the horse and buggy medium, the death figure was 675. The widespread use of the automobile and its high rate of speed account for the increase in crossing accidents.

The continuation of such accidents has made it imperative that steps be taken to lessen the possibility of automobiles meeting trains at junction points. Since federal aid work was launched in 1916, nearly 1800 crossings have been eliminated through two methods, by separating the grades and by changing the highway routes. Nearly two-thirds of these crossings were avoided by rerouting the roads.

Of the 414 crossings eliminated during 1926 on federal aid projects, 202 of them were by relocation of highways. A number of states have also taken steps to eliminate grade crossings. In making plans for pavement building many communities are including funds for the construction of under-passes and over-passes.

There are 232,755 grade crossings used by motorists in the United States. Of this number only 27,161 have protection in any form. Highway authorities point out that if the yearly accident toll is to be reduced still more attention must be paid to grade crossing elimination. This is especially urged near populous communities where Saturday, Sunday and holiday traffic is heavy. Here grade separations are urged inasmuch as they not only provide safety but a continual traffic movement.

A general survey has shown that no real progress toward reduction in crossing accidents has been achieved. Educational campaigns and traffic regulations have succeeded only in holding the death list to about the proportion of the increase in the number of cars.

Is the Public Grateful?

"Of particular concern to the public is the intelligence that railroad operation, especially as it refers to freight shipments, attained to new levels of efficiency in 1926. The public, perhaps, may not acknowledge its concern in this phase of the roads' development, yet it requires no legerdemain of reason to prove that the increasing speed and certainty with which freight is moved, and the expeditious loading and unloading of cars, contributes greatly to the nation's general economic well-being.

"The dividends which efficient freight transportation pays are measured in greater business stability, in greater employment security, and in a greater and sounder industrial activity. If the railroads' progress toward maximum freight efficiency does not, therefore, inspire some measure of public gratitude, a fine and outstanding contribution to the nation's welfare will have been inexcusably ignored."—Minneapolis Tribune.

Motorized Delivery for Stores

By W. S. Morehead

Motorcycle Delivery Cart Used by the Store Department, Illinois Central Railroad at Chicago.

IN getting data to be used as a basis for this report the committee was divided into five subcommittees of three members each; these subcommittees were selected territorially, and assigned a group of railroads in their respective sections. By thus dividing the committee we were able to visit 28 of the leading railroads in the United States and Canada, and obtained a written report of five additional roads. The roads thus covered represent approximately 75 per cent of the mileage of all Class I railroads.

We find on the roads investigated the principle of organized store or shop delivery recognized as a sound practice, although its application ranges from practically 100 per cent organized store delivery at some points to nothing of the kind at other points.

The equipment used consists of about everything manufactured from a two-wheel warehouse truck to a locomotive crane, with very little progress made to date in unified control of this equipment.

The organization for handling varies from organized handling force to the old method of shop men calling at storehouse for their individual needs. This wide variation not only applies to practices on different roads but in many cases to different points on the same road. From the study made and from information obtained the committee recommends the following:

We find various types of cranes and trucks used for unloading of cars; conditions vary to such an extent that it would be impossible to recommend any one particular type of crane to suit all conditions. Material can best be handled to and from open cars by overhead type of cranes (Bridge or Gantry), locomotive type, electric or gasoline type, local conditions to govern as to which type is most suitable.

Owing to the various usage to which these cranes are put it is the recommendation of the committee that the control of operation of each crane be vested with the department requiring the greater portion of the time of the crane.

In handling material from box cars at platforms, lift platform trucks with skids are well suited for this work; this particularly true of material stored in buildings or on platforms adjoining or adjacent to unloading platforms. In using lift trucks with skids it will often be found advantageous, where material is to be reloaded or delivered to point for use within a short time, to allow material to remain on skids thereby saving two handlings. Certain items that come in and go out in quantities equal to a skid load may be left stored on skids thereby saving two handlings. Local conditions will, of course, determine to what extent this is advisable.

Tractors with large wheels, and trailers should be used where material is to be handled a considerable distance or where platforms or roadways are in poor condition.

Gravity conveyors can be used to advantage for the handling of lumber, brick and similar items where track arrangements are such that cars cannot be spotted in close proximity to storage pile.

This service should be in charge of a delivery supervisor who should report to the general foreman of the supply department. He should have an office centrally located, equipped with telephones and such

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Condensed report of a committee of which Mr. Morehead is chairman, Division VI, Purchases and Stores, A. R. A., appointed to investigate motorized and unified delivery of materials. Sixteen members of this committee represented that many Class I railroads. Photographs for illustrations were supplied by Mr. Morehead who is assistant general storekeeper at Chicago for the Illinois Central R. R.

office and other assistance required. However, small stores should understand that such extensive organization and equipment is not necessary to put organized material delivery into practice.

In order to coordinate all the delivery and transport effort and to realize, from a general standpoint, the maximum efficiency and economies from the investment in power trucks, tractors, trailers, skids, improved roadways, etc., it is recommended that all power equipment assigned to the plant for material transport in or out of the plant be placed under the supervision and direction of the delivery supervisor.

The plant should be divided into zones or sections, size and number to depend on volume of work performed, and each of these zones assigned to a stock or zone man who will report to delivery supervisor. It should be the duty of each zone man to patrol the zone assigned to him, gather all material orders and be responsible for delivery of material on these orders.

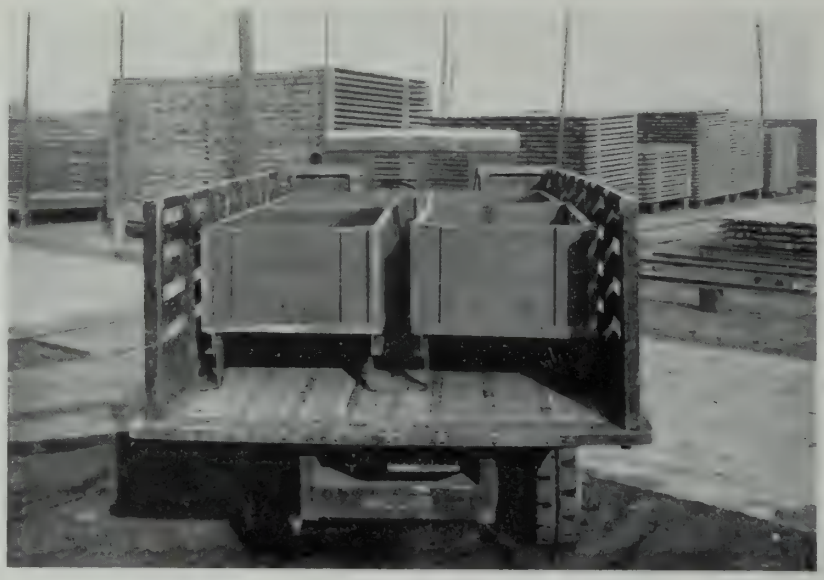
The number and duties of the various men assigned to this service, will of course, vary with the size of the plant and volume of business handled.

As a general rule heavy material handled by trucks, cranes, tractors and trailers or by lift trucks which cannot be loaded and unloaded by the truck driver without delaying tractor or truck should be loaded by department making shipment and unloaded by department receiving shipment, thereby saving travel time of men following truck or tractor.

Each zone should be provided with as many material order boxes as necessary to prevent excessive loss of time of foremen or men in depositing orders. There should be but one class of material specified on an order.

In event material ordered is not in stock, item should be cancelled from order and the foreman notified.

Orders for equipment for use in transporting material between shops, between shop and store, for moving of scrap or rubbish should be placed in order boxes from which they will be gathered by zone stockmen or truck drivers on regular trips and passed to delivery supervisor for handling.



Tiering Truck Used in Material Delivery.

Equipment required will depend on location of store with respect to shops to be served, conditions of roadways and platforms and volume and nature of material to be handled.

A light two-wheel hand cart or three-wheel wheelbarrow is well suited for light material. Electric platform lift trucks with skids and tractors and trailers for heavy materials.

Specially constructed trailers are desirable for certain items such as mounted wheels, tires, locomotive cylinders, etc., cuts of various types in use are being shown in railroad trade magazines from time to time.

The more recently constructed shop and store plants have provided concrete roadways. Division VI is on record as favoring this type of road construction. It is the opinion of this committee that concrete roads are preferable. The committee finds that considerable progress is being made in providing roads in some of the older plants. We believe the matter of good road construction should be made a constant recommendation by the stores department as much time in the delivery work will be saved, also less upkeep of equipment employed will be required.

Consideration should always be given to the advisability of unloading material upon receipt at the point of use. This committee believes this is advisable only when material is for specified work programs and then only when received in carload lots and track facilities are such that material can be placed in desired location direct from car without extra trucking and handling. We feel that material received in LCL lots where it is necessary to unload at storehouse and not required for immediate use, should be unloaded and placed in storehouse rather than reswitching car or trucking to point of use.

We feel no system of delivery would be complete without some method being established to determine its efficiency as compared with previous methods and as compared to performance one month with another. Our investigation does not disclose any uniformity in keeping of such record at present. A form that may be of value to railroads planning on establishing or extending organized delivery service may be obtained from the committee.

Fuel and the Human Element

Leadership Is The Test

By H. S. Rauch

Supt. M. P. New York Central

HISTORY of all activities, since the beginning of the world, shows that where the human element entered into any undertaking, success or failure was entirely dependent upon the type and quality of leadership.

You who are in positions of authority and upon whom rest the responsibility of economic operation of the railroads with which you are connected, must first be thoroughly sold to this proposition of fuel economy. You must not only believe there is something in saving a pound of coal per passenger car mile or two pounds per 1,000 gross ton miles, but you must be enthusiastically sold to it —it must become an obsession with you before you can hope to pass it on and sell it to those who report to you.

It should be remembered that not only the man who wields the scoop is responsible for fuel saving or lack of it—every officer and man from the presidents of our railroads down, have a part, and a most important one to pay; track layouts, elimination of grades, curves and dips; signals and signal maintenance; equipment and its state of repair; time tables governing operation have a most important bearing; even the section man can waste fuel stopping trains unnecessarily; the inspectors of equipment, through carelessness, can cause vast waste of fuel by allowing work to get by which will cause delay on the road.

Train dispatchers, by making poor meets, can be a very prolific source of waste.

Baggage men and transfer men, expressmen, mail men holding trains unnecessarily, thereby causing loss of time which must be made up, cuts deeply into the coal pile.

The careless coal dock men who overload tenders; the slow switch tender who causes a train to come to a stop; the operator out on the road who is slow handling of orders on territories operated by the train order system.

Steam leaks allowed to exist, careless power plant operators; lights burning when not needed, the so-called "standing" losses in fuel, where 23 per cent of the fuel consumed by American railroads is burned at present, offer a wonderful field for economy in fuel.

Heavy fires brought in off the road resulting in a high coke content in the cinder pit; engines allowed to stand for long periods between receiving track and engine house; frequent pop openings; improper methods in fire cleaning and banking; mismanagement in making air and other tests requiring maximum steam pressure, necessitating breaking up fires once banked; lax supervision in properly banking fires, unnecessarily large quantities of coal used in firing up engines that have been dumped; firemen arriving early and preparing the fires for road service before leaving engine house territory, resulting in engine popping many times before reaching yard and train, all controlled by the human element. Indeed the vastness of opportunities for fuel conservation are almost beyond comprehension.

Bring this home to them with sufficient force and the results will be most gratifying to all who have been privileged to have a part in it.

In the final analysis, fuel conservation simply means better railroading and 100 per cent return for fuel consumed means 100 per cent railroad operation, in all of which the human element is not only the most outstanding and of highest importance, but is the keynote to success or the loadstone of failure. Towering over all is the gigantic structure fabricated of human beings each member a unit in itself with power to think and to act in a manner individual and independent.

Having to deal with many men of many minds, it is plain that a right viewpoint must be reached and all brought to vision the objective from that angle.

The stellar features required to bring this about are confidence, mutual respect, human understanding, "horse sense," and a working knowledge of the Golden Rule.

If you expect the highest type of service from a man, he must feel that you have confidence in his ability to perform that service; you must also show respect for his opinions and he, in turn, will have confidence in and respect for your desires.

Human understanding and "horse sense" together with an understanding of the Golden Rule simply make the formula with which to reach an efficient relationship.

Men cannot do their best work, as a rule, unless they are happy and to be happy a man must feel safe, comfortable, and have a reasonably bright outlook on the future.

No man employing labor can attain complete success unless he

Abstract of an address before the International Railway Fuel Assn.

gives due consideration to the happiness of those in his employ, for happiness is the chief goal in human life, and one cannot attain it alone. Someone has truly said: "There is more happiness to be obtained in treating the other fellow to a plate of ice cream than in eating two plates one's self"—all of which leads up to the fact that success with the human element in fuel conservation requires a close personal contact with the forces using the fuel; a general understanding of their problems, both on the job and off; a desire to complete cooperation in doing your part in making working conditions as pleasant as the job will permit. Do not give an engineer an engine that is lame, blowing, leaking, or in any other manner seriously defective and expect he is going to have faith in your sincerity when you talk to him about black smoke or safety valves lifting.

You cannot practice back-hauling of cars; permit signals to be so operated as to stop heavy trains in bad places; make poor meets on single track lines or otherwise hamper train movements unnecessarily and expect train and engine crews to become enthusiastic over your program of fuel saving.

Give men your cooperation; show them you mean what you preach by being a practitioner thereof; make the job a game at which all play according to the rules, create a friendly spirit of rivalry, their objections will vanish; wholehearted interest will take its place and the results will be reflected in the coal bills.

You Can't Win

The man at the wheel of a speeding motor often fails to appreciate the grave responsibility he assumes for other lives. What is true of the road hog and the reckless speeder is also true of the driver who tries to beat the train. All too often it is not alone the lives of such drivers and their passengers that are sacrificed to criminal folly, but trains are wrecked, with loss of life among their crews and passengers.—Chambersburg (Pa.) Repository.

MacRae's and Hendricks Now

The well equipped business office nowadays has, among other things, the several directories needed for quick information. No office is complete without a telephone directory and city directory; and if time is valuable, which usually it is, MacRae's Blue Book will be found handy. MacRae's has now been consolidated with the Hendricks Commercial Register, and both have been issued bearing the combined name in one volume. The publishers, Macrae's Blue Book Co., 18 East Huron Street, Chicago, will send a copy upon application to any railroad official who buys or specifies purchases if he has not already received one. The book is excellently printed, intelligently arranged as to contents, and is an indispensable aid for busy men.

The Panoramic Special, D. & R. G. W. Ry., in the Royal Gorge.

Editorial Comment

The Definite Purpose

IF THERE is one more indictment which may justifiably be brought against the much-abused rising generation, it is the charge of indirection —the absence in the average young man of objective, the definite purpose so necessary on the road through life. Some very fine thoughts on this important subject are contained in the address by President Harahan of the Chesapeake & Ohio, appearing elsewhere in this magazine.

President Harahan shows himself to be not only an accomplished executive of long experience but a rather keen judge of human nature in the formative period. His advice to the Younger Railroad Men's Conference at Huntington is valuable and extremely interesting.

In Ladd's book on Japan a story is told about the Mikado's sending a telegram to Admiral Togo during the war with the Czar's forces: "Find and destroy the Russian fleet."

For several days Admiral Togo paced the quarter-deck taking up and discarding one plan after another in anxious haste. Finally one day he sent this message to the Emperor "after a thousand useless thoughts now one set purpose" and within a few hours that part of the Russian fleet that had not been sunk was captured. More perhaps than the personal intervention of President Roosevelt, this determination led to the peace of Portsmouth.

Some philosophical poet whose name has been lost but whose verses still remain in memory said:

> Live for something. Have a purpose,
> And that purpose keep in view.
> Drifting like a helpless vessel,
> You can not to life be true.
>
> Half the wrecks that strew life's ocean,
> If a star had been their guide,
> Might today be riding safely,
> But they drifted with the tide.

The Price of Progress

The comforts and conveniences of civilization have been achieved at great cost. Explorers, inventors, promoters, the world's builders, have given their lives in seeking success—not for money, but for glory and fame and, in most instances, for the common good. Men always have been willing to face great risks of life or fortune to prove a theory, to be the first to reach a goal. History is filled with their exploits. As far back as we can trace men have been going out, often for the unattainable, and have never come back again. The poles, north and south, have claimed many, and these, perhaps, had the least of all to gain. Andree's balloon tragedy in 1897 was the first of the air tragedies. His fate is as much a mystery today as it was 30 years ago, as unfathomable as the fate of Nungesser and Coli, the gallant Frenchmen who tried to fly from France to America. To this tragic list we must now add the names of seven brave souls one of them a woman who, doubtless, went down to their deaths somewhere in the Pacific between the mainland and Honolulu. It is a fine tribute to American aviators that these pitiable sacrifices have not discouraged further efforts in the air.

Mr. Gary's Work Finished

Long before this magazine is in its readers' hands perhaps, the country will have ceased to talk about the life and death of E. H. Gary. We move so fast and there are so many distractions, in these hurried times. What a fine thing it would be, and how extremely profitable, if every young man of twenty might read the Story of Steel, the life and the wonderful work of this man. Like practically all great successful men, Mr. Cary contended in his youth against many disadvantages, against every kind of discouragement. After he reached manhood in Illinois, he still faced and overcame obstacle after obstacle until, finally, he reached the top. Mr. Gary always was a simple man, simple in his ways, sincere, earnest, and in every imaginable way a courteous and kindly gentleman. You can't say much more than this for anyone.

Self Preservation

Employes may be suspicious of management, as someone said recently in talking about the contents of railroad company magazines, but they can scarcely be entirely ignorant of their own good interest. The writer of this piece talked to 13 train service employes on three railroads, not long ago, asking whether they ever had solicited freight shipments for their roads. Only two replied in the negative, and neither was ill tempered about it. The other 11 never neglected opportunities presented to increase their companies' business. They considered it work in their own interest, and this bespeaks intelligence.

One thing is quite certain: Any man who won't help to get the money to pay his wages should not have wages. Any man who signs his name to petitions favoring a competitor over his own company ought to be fired. Any man who spends his wages in stores that will not ship over the lines employing him is guilty of what has been called unintentional

or ignorant disloyalty, which is a charitable designation for treachery.

And one more certainty: If railroad employes don't get out and hustle, in addition to their required labor,—hustle for freight and passengers to increase earnings—they are going to find themselves out of earnings one of these days; they may not be discharged—they simply won't be needed.

Mail By Air or Rail

Until air mail service has been extended to include smaller cities not now served originally by airship one finds railroad service just about equal to air. In part this is caused by the fact that from many eastern cities air mail goes first to New York before being put into the airship. Ultimately, of course, this deficiency will be overcome, but until it has been so arranged one gains nothing for the extra eight cents postage on the half ounce.

A test was made recently between Schenectady, N. Y., and Los Angeles. Two letters were mailed the same afternoon. One went by air mail, the other by regular train. The letter by air mail arrived on the noon mail delivery in Los Angeles four days later. The letter mailed in the regular way arrived on the 3 P. M. mail delivery of the same day. There was but three hours difference in the arrival of the two letters.

If the air mail letter had gone to Cleveland, and had there been transferred to an airship it might have gained a day or a night. Going to New York it lost that much.

This is not a reflection on air mail speed or efficiency as it is now constituted. It is intended only to show the need for still further improvements in schedules.

The Friendly Helpers

The committee on public relations of the eastern railroads of which Robert Studebaker Binkerd is vice chairman, has obtained statements from eight railroads involved in the Mississippi River floods. These railroads are: the Illinois Central, Southern Pacific, Missouri Pacific, St. Louis-San Francisco, Texas & Pacific, St. Louis Southwestern, Kansas City Southern, and Chicago, Rock Island & Pacific.

From the beginning of the floods up to June 15, 1927, these eight railroads:

Operated 304 special relief trains.

Brought out 104,788 refugees.

Saved 2,479 carloads of household goods and live stock.

Supplied 4,794 cars for temporary living quarters.

Transported 504 carloads of food and supplies.

These services were in addition to the labor of thousands of their own maintenance employes; the transportation of tens of thousands of laborers from plantations to levee protection, and the transportation of many thousands of carloads of sand, rock and lumber used in protecting levees.

All of these services were without charge. The railroads in question do not attempt to place a money value upon their contribution. The relief authorities, however, have estimated that value at not less than five million dollars.

But the People Pay the Bill

"Any time Uncle Sam really wants to do a big job," says the government ownership Examiner, "that job gets done, and gets done right."

The Examiner, as usual, is wrong. It's the people that are done, and done right.

"After several years of gradual building up since the outright sale of the government ships was prevented by the injunction secured by William Randolph Hearst a nice profit of nearly $400,000 on the operation of five high-class liners is shown for the fiscal year just ended. Superior service is the key to this success."

Any time the people of the United States will supply the money—without interest on the investment—there will be no difficulty in showing a "nice profit" on any enterprise imaginable. Will Mr. Hearst now arrange to take up the millions of deficits charged against these five ocean liners?

Now Wait for the Blow-up

The Interstate Commerce Commission has given permission for the Southern Pacific to purchase the Central California Traction Co., on condition that the Southern Pacific resell equal shares in the control to the Western Pacific and the Santa Fe.

This means committee management. It won't succeed. Such control never has been satisfactory, and in transportation it is practically certain that no better record will be made. You might just as well put three families into a bungalow and expect them to keep out of police court. It can't be done. The unfortunate officers put in charge of the Central California Traction property, obviously, will report to a selected committee. The first row will come over the division of through business, unless perchance, they adopt the Potter Plan of unholy memory, and agree to split the revenue into three parts regardless of which road does the work. There are times when the Interstate Commerce Commission displays, about railroad matters, all the keen understanding of an old maid in a nursery.

Where the Revenues Go

The money received by railroads for the carriage of freight and passengers is turned back to the public quite as rapidly if not more rapidly than any other items of revenue originating in connection with modern business.

Out of every dollar collected by the railroads, 75

cents is expended either in the same month in which it was collected or in some month previously.

Fuel must be purchased in advance of requirements, and this requires working capital. Other materials and supplies must be purchased in advance of requirements, and such expenditures require funds even before the service is performed.

Wages amounting to 45 cents out of every dollar earned are paid to employes often before collection of the freight charges which accrue through the effort of those same employes.

In addition to this there are taxes, rentals and miscellaneous charges to be paid out of current revenues. After all these requirements are met there are interest payments due to investors and dividends due to stockholders.

Fuel and wages have the first claim upon railway revenues, while interest and dividends come last. Thus the entire revenue collected by the railway company is almost immediately turned back into the channels of trade. These moneys pass to the pockets of the miner, grocer, butcher, merchants, and the city officer. The amounts disbursed as interest and dividends eventually find their way into these same channels through the expenditures of the people who receive them.

General prosperity cannot be promoted by limiting railway revenues to an unduly low level, because such restriction tends to limit all classes of expenditures enumerated.

How Do You Buy Your Locomotives?

"The cane you ring is the cane you get, is the cane you carry away."

To many of us the old ballyhoo cry of the side show on circus day is familiar. Many a time we were fascinated by the fine looking canes on display, and the barker's assurance that every one was worth at least $5. After dissipating our dimes in trying to ring the particular cane of our choice, and granting that our skill was great enough to secure the coveted prize, how often have we found that the quality of the article was disappointing, to say the least?

Peculiar as it may seem to some of our progressive men and the best of our engineers, we find today almost parallel with this old game, the purchase of some of our motive power. Some roads are still possessed with the one idea of getting the engine whose appearance seems to satisfy their personal viewpoint, giving consideration only to how cheaply they can get it. When engines are bought with price alone in mind the results are almost certain to be disappointing.

We have arrived at the time when the ounce of coal and the ton of freight are so important that the only correct procedure is to analyze the road and operating conditions thoroughly where the motive power is to be operated and to buy the engine which can meet the requirements of the district by delivering the greatest amount of horsepower consistent with lowest possible fuel consumption at the same time giving consideration to the question of economical maintenance. The first cost of the power should be purely incidental to these more important problems.

What They Say About Us in England

The monthly review of Barclay's Bank Ltd., for August expressed confidence in continued prosperity for the remainder of the year in the United States. Barclay's agents in this country admit, however, some belief in the opinion that trade and industry in the closing months may be less satisfactory than a year ago. "The beginning of the second half of the year," said the review, "found trade rather quiet and the pace of industry slackened. Wholesale trade has been running somewhat below the levels of 1926, and railroad freight transportation, although showing a fair margin of gain, has not kept pace with the growth in population, while several important lines of manufacturing have shown more than a seasonal decline. The agricultural outlook, although distinctly better than a month ago, is not uniformly bright, and government estimates show a very uneven situation. The full measure of the losses arising from the Mississippi flood cannot be fully known until the crop year is completed, but a factor in the other direction will be the higher prices for some farm products, a result which ought to benefit growers in other parts of the country."

It is interesting occasionally to see ourselves as others see us.

The Editorial of This Edition

THE chairman of the Interstate Commerce Commission, B. H. Meyer, has a very hard job. He is required to know a great deal about the laws regulating the nation's transportation systems. He must be rather well-informed about rates. He ought to know the United States Constitution, a document which seems to have been somewhat overlooked with respect to the rights of property in transportation matters. Indeed, this government officer has such an overwhelmingly intricate mass of material to study and digest that it is scarcely fair, perhaps, to expect him to keep fully abreast of the current developments touching the remarkable economies, the highly commendable efficiencies of the country's railroads. This would be asking a little too much.

But certainly it is not unfair to suggest that the chairman refrain in the future from speaking for publication on subjects about which, quite evidently, he is not informed, to put it courteously.

The occasion for this criticism is found in an

interview credited to Mr. Meyer, and circulated very widely during recent weeks in the newspapers of the Southwest. In this interview Chairman Meyer, if the papers quoted him accurately, described himself amazed and delighted over the economies and general reclamation work of the Kansas City, Mexico & Orient Railway, one of the Stilwell enterprises long in receivership, and for several years maintained in a gradually improving condition through the careful and intelligent nursing of William T. Kemper of Kansas City, and associates. Despite the best they could do, however, these gentlemen were compelled to borrow several million dollars from the government, and this fact explains Chairman Meyer's immediate interest in the condition of the property, and also his visit of inspection.

This was all perfectly proper. The Orient has done exceedingly well under the circumstances, which were sufficiently discouraging, goodness knows. With little money, no great volume of traffic, freight or passenger, a large part of its line running through a disturbed nation, the Orient, through its efficient management, has carried on commendably for years, an orphan in transportation. It is entitled to praise, but when Chairman Meyer, metaphorically speaking, holds it up to view before the world as an example to be emulated, and declares, according to the interview, that he intends to urge all Class I railroads to adopt its economies and its methods of reclamation, only two things are accomplished: the chairman proves himself a good many years behind the times, and he offends railroad men everywhere. Here is the particular statement charged to him:

> "I have seen so many short cuts to economy in its operations and management that I am going to recommended to Commissioner Frank McManamy, who is our expert on mechanical operations, to send investigators to the Orient shops at Wichita to see how necessity has been the mother of invention on this line.
>
> "If the Orient can do these things, other lines should be forced to do likewise. It is a revelation and its management has set an example of thrift and economy which have given me a new insight into what can be done when you really have to."

Fine praise from a high source, but unquestionably the most ill-judged statement ever issued by the chairman of this commission, if the papers have reported him correctly. By implication Mr. Meyer declares the other railroads are highly wasteful and lacking much of real efficiency! If Chairman Meyer knows anything at all of the actual conditions of our railroads certainly he should know that at no time in their history have they been so economically and so efficiently managed. The entire industrial and commercial world has acknowledged this fact.

But by far the most offensive thing Chairman Meyer is charged with saying is this: "If the Orient can do these things, other lines should be forced to do likewise."

Can you imagine it? And at the moment the chairman was speaking he was only a short distance from one railroad, in the same district, the M-K-T, which is credited with being one of the first, if not actually the leader in the reclamation work and economies which seem to have stunned Mr. Meyer when he discovered them in the Orient shops. Practically all the Class 1 lines have for many years been doing all these things, and many others of which the Orient probably never heard in its brief and troubled career. If this inspection astonished and pleased him, how much he might learn of value, how highly he might be edified, were he to undertake a countrywide tour, and learn what actually is being done by the railroads in these particular directions. It might be a wise move, too, for the other members of the commission to go along. They have been very busy men, especially since the World War. Perhaps they haven't had time to read magazines in which all these economical practices have been described, time after time, for years. They have been studying rates.

For the most part, with the exception of men like Frank McManamy, perhaps, the commission has been regulating something it has never seen intimately. The members have concerned themselves with the finances of the roads. They have not studied the fine human qualities of this great machine called transportation. They ought to get out occasionally, like President Coolidge, and meet the people, the folks that ride in the smoker. They ought to study the railroads in the shops and the yards. Or, if they can't find time to do this, they should not give out statements for public consumption that are misleading. Such statements convey the impression that the large roads are inefficient and wasteful, and this creates the belief in the mind of the ever-gullible ones that another reason has been discovered for the supposedly high rates.

A Suggestion to Railroads

A dinner in the clouds is the latest novelty offered tourists who have tasted all the old delights of the Ville Lumiero. De luxe airplanes of one of the large companies are now providing food for visitors soaring over Paris. It is cooked in the airplane itself, by an expert French chef and served by the trim French garcon who speaks English. The aerial restaurant has already proved extremely successful. It is now considered very chic to entertain one's friends in this manner. Now, if some live railroad press agent could only induce a real social leader to entertain her friends—or guests if she has no friends—in a dining car.

What's the News in Washington?

The Coming Session of Congress

By W. E. Hopkins

EFFORTS to bring about the enactment of railroad consolidation legislation along the lines of the Fess-Parker bill proposed at the last session, are to be made when congress reconvenes in December, according to the general understanding prevailing in Washington. In view of the composition of the senate, however, there is some uncertainty in the minds of persons familiar with the situation on the hill as to whether such a bill can pass both houses of congress at this time.

With the house interstate and foreign commerce committee strongly in support of the bill proposed at the last session by Chairman Parker, it is believed that such a bill can be passed by the house but in view of the fact the Republicans in the senate will have only a paper majority of one over the Democratic strength, it is considered somewhat doubtful whether any final progress can be made in that body.

Reports have been current in New York to the effect that certain leading executives have decided to give up support of proposed railroad legislation as typified by the Fess-Parker bill, and are to be content with the existing provisions relative to railroad consolidations as embodied in the Transportation Act. Denial is made in certain authoritative quarters that there has been any change in the attitude of the leading executives. In fact there seems to be an opinion in Washington that the New York reports are based entirely on the views of a very small minority that has never sanctioned the proposals outlined in the Fess-Parker bill.

Intimations to the effect that

President Coolidge might call a special session of congress in October or even might call only the senate into session to effect an organization are not taken seriously in Washington. Congressional leaders such as Senator Curtis, Speaker Longworth, and other men high in the ranks of the Republican party, are quoted as being opposed to any such step. Even should the President determine to assemble congress prior to the regular date for convening in December, it would be contrary to the wishes of party leaders.

Marked progress has been made recently in making public the Interstate Commerce Commission's valuations of certain of the large railroads. The latest to be announced is that of the Baltimore & Ohio, for which a tentative valuation has been fixed by the commission of $579,679,283. The figures include appreciation, depreciation, going-concern value, working capital and all other items which appear to have a bearing on the worth of the property. The commission aggregates the figures as follows:

Property owned and used	$348,250,000
Property owned but not used	1,297,475
Property used but not owned	231,429,283
Total property owned	349,547,475
Total property used	579,679,283

These figures, which do not include a separate valuation of $31,467,733 placed upon the property of the Baltimore & Ohio Chicago Terminal R. R. Co., compare favorably with the carrier's outstanding stocks and long term debt, which have a total par value of $648,897,698.

The commission has also announced that the final value for rate making purposes of the Atchison, Topeka & Santa Fe as of June 30, 1916, was $579,057,598, including $15,665,500 for working capital. The commission valued the total owned property of the Santa Fe at $400,990,818 and the total used property at $486,346,917. The commission originally placed a tentative valuation of $566,896,084, including working capital for the Santa Fe, but various differences between the carrier and the commission were adjusted, which accounts for the difference finally agreed upon by the commission compared with the previous figure.

The Union Pacific has filed with the commission a protest against the valuation as proposed in the tentative report of that body. The commission assigned a value of $242,426,352 on total owned property and of $242,064,968 on total used property of the Union Pacific, which the road says is too low.

Transportation in 50 Years

The Winning Letters

IT was the intention originally to select one letter from those received in response to the contest question "What, Do You Imagine, Will Be the Prevalent Form of Transportation in America 50 Years From Now?" So many really thoughtful and well written letters were received, however, that the judges—after selecting five for the finals—were unable to select a first prize winner. It was decided, therefore, to treat all five alike. Checks will be mailed to the writers in due course. The winning contributions are presented herewith.

The whole purpose in this little contest was to gain some idea of just how men are thinking, these days, about transportation. The winning replies came from Pennsylvania, Illinois, Missouri and California and all were written by railroad employes. The letters:

Until a few weeks ago, when Charles Lindbergh and Clarence Chamberlin illustrated to the world what future transportation would be, it was rather hard for one to imagine just what might be the prevalent form of transportation in America 50 years from now.

One can readily see that practically 90 per cent of all through passenger, mail and express business will be handled by high speed airplanes carrying from a hundred to 200 passengers arriving at terminals in the heart of the cities. No doubt, 24 hour service, or schedule will be maintained between New York and California. Of course, long freight hauls will be handled by airships constructed along the lines of the Zeppelins which will be somewhat slower than passenger service.

The local transportation passenger and freight service will be handled by large gas electric rail motor cars at a high rate of speed, and buses. In most of the larger cities at the present time large buses have replaced the local steam train service, as they can be operated for much less than steam locomotives.

A. E. Wooldridge

St. L.-S. F. Ry.,
Springfield, Missouri.

Fifty years from now, transportation of slow class freight will be handled by railroads or auto trucks electrically driven. Mail, high class freight and passengers will be transported aerially by means of power transmitted from stations properly located. Suitable conveyances with every comfort will be provided, or individuals may travel by the aid of a simple instrument carried, or strapped to their bodies, simply floating in the air. Traffic moving east will move in a certain plane of elevation above the earth's surface; westbound traffic will move in a higher plane; northbound still higher, etc. Speed will be the same in all portions of the same plane; that is, when entering the plane it will be slow, but on going higher will increase until the maximum, after which it will decrease until reaching the point of entering a plane of a different direction or a neutral plane, when it would be practically nothing. To avoid confusion and accident, no traffic permitted over cities except that arriving at or leaving that city. Departure from the earth will be vertically, at controllable speed until the desired plane of direction is reached. Descent will be similar.

R. J. Hotaling

Master Mechanic's Office,
A. T. & S. F. Ry.,
San Bernardino, Cal.

Fifty years from now coordination still will be the watchword of progressive transportation agencies. Under one ownership, and probably under separate management you, providing you are then alive, will see bigger and heavier freight trains carrying the bulk of staple and building materials to market by steam, but the use of electric motive power will be multiplied many fold. You will hear dirigibles droning overhead with their cargoes of perishable freight and express, with the season's first offerings to an eager public from the four corners of the nation and beyond. You, being an elderly man at that time, will make a long distant trip by passenger train, while your more impatient fellow man and very impatient fellow woman will zip by in an airplane, waving flirtatiously with you as they pass. They may land at the first important terminal and finish their journey with you. If you glance out the window, you may see passenger buses and trucks, performing their useful service on a highway built on a part of the railroad's original right of way. You won't see any unprofitable branch lines, but they will be utilized for similar purposes. When you reach your journey's end, you may be whisked by aerial taxi to landing fields conveniently near your home, or homes. Ocean carriers will undergo a similar change. The vacationist, the idler, the timid, and those with plenty of time on their hands will travel by vessels, as will the dead freight, while important documents, including sales orders, and the business man always in a hurry to keep an appointment, will travel in the air.

Edw. H. Sharpe.

Southern Pacific Co.,
Los Angeles.

The prevalent form of transportation in America fifty years from now will be extensively restricted to automobiles, airplanes, the motor bus and electric lines. The automobiles and airplanes will continue to play an important part in transportation for the individual family use. Airplanes primarily will be used for through passenger service and handling light, high class commodities on regular schedules between all important cities. The motor bus will be restricted to local passenger service and handle local shipments of L. C. L. nature on regular routes as our present local train service with exception of suburban passenger trains in densely populated areas, which will be handled by electric lines.

Through passenger trains will be handled by electric engines similar to those now in use on C. M. & St. P. with adequate electric power for handling heavy local commodities and through shipments replacing our present steam railway systems. The motor bus and electric lines will be operated by systems and owned by large corporations. Large dams similar to one at Keokuk, Ia. will be adequately equipped and maintained at various waterfalls throughout the west, including Niagara Falls which will supply abundant power.

R. E. Garner

Wabash Railway Company,
Springfield, Illinois.

Almost without question, the railroad will be the prevalent form of transportation in 1977. For the airplane to be commercially practicable transmission of power by radio must be accomplished, and present indications are that this art will not be developed sufficiently within the next 50 years to replace the railroad.

Both the airplane and the motor truck or bus have two great handicaps, the first of these being lack of safety. Relative to traffic carried, air and highway vehicles have by far the greater accident records. As to the second handicap, take your pencil and calculate the number of airplanes or buses required to carry the passengers of one "Limited," or the number of airplanes or trucks necessary to carry a freight train's load of goods. These few figures should leave little doubt as to the railroad's supremacy.

Means of equalizing centrifugal force on curves and a development of flanges, together with the use of roller bearings, will permit safe speeds comparable to those of the airplane. Improved couplers will mean jarless starting and noiseless running. Electric refrigeration will keep perishable goods in good condition. Electric locomotives will reduce costs and make railroad travel fast and clean. The railroads are but beginning to come into their own.

W. E. Bostwick

1522 20th Ave.,
Altoona, Pa.

Little Stories About Big Men

THE sou'westers, raincoats, and boots in the accompanying illustration conceal, partly at least, two personages now very active in the transportation world. The gentleman at the left, is Arthur Curtiss James of New York. You've never seen his picture. You are going to hear a great deal more about Mr. James in the future than you have in the past—not that he has suddenly changed his mind about staying out of the blinding light that beats more or less brightly over men who do big things and try to do them quietly, but because many events of great importance in this country will point the calcium his way whether he likes it or not. Just one moment—there'll be more about Mr. James. Don't go away.

At the right of the picture we see Ralph Budd of whom, naturally, you have heard much. Mr. Budd, it is scarcely necessary to say, is president of the Great Northern Railway, which is why you recognized him immediately. You'd never get it out of him in a blue moon, but Mr. Budd is one of the up and comers of the railroad world. For a while he was hailed as the youngest railroad president in the world, a distinction he will outgrow only too soon, alas, at least with respect to years. Then Colonel Howard, the young president of the Chicago Great Western, bobbed into the picture of youthfulness, to be followed by R. B. White, who succeeded to the presidency of the Central of New Jersey last spring at an alarmingly early age, and now it isn't easy to say who really is the youngest executive, even if it were important.

As Mr. Budd always refuses to say a word about his past life, one must go to the imperishable archives, and there it is disclosed that

What They're Wearing This Season In and Around the Great Northern's Cascade Tunnel.

he was born in Waterloo, Iowa, in August, 1879. He started his earning career in the engineering department of the Chicago Great Western in 1899, which means, to those who know, that he drove many stakes with tacks in them and carried tons of chains and things before he became assistant engineer. He must have delivered the goods promptly, because in three years he filled several jobs: roadmaster, general superintendent of construction, and division engineer. Then the Rock Island had him for four years; he was chief engineer for the Panama Railroad at Colon from 1906 to 1909; he held the same position on the Oregon Trunk Ry., the S. P. & S., and the Spokane & Inland Empire. Mr. Budd had several important posts between 1909 and 1912 and finally, in October, 1919, became president of the Great Northern Ry. And there he is today.

Arthur Curtiss James of New York is a name seldom heard outside of that city until a few years ago, for the very simple reason that the man avoided publicity of every kind. Pleasant, affable, easy to approach, but shy when writers were around. When finally he did become known west of Hoboken, it was in connection with several amazingly large and important railroad mergers, purchases and what not. Executives of one road after another began shifting around in most interesting ways, and no one knew why until it developed that the power under the shifting mechanism was none other than our hero, Arthur Curtiss James of New York.

For a while the most interesting stories were told about him. He was booked among the men worth knowing as a merchant, which may cover a multitude of activities, and in the case of Arthur Curtiss James, apparently, it did just that, for the record shows him to be, among other things, president of the Curtiss Securities Co.; vice president and director of the Phelps-Dodge Corpn. and its subsidiaries; director of the C. B. & Q. R. R., the Colorado & Southern, the El Paso & Southwestern, now a part of the Southern Pacific; a large stockholder in the Southern Pacific, the Northern Pacific, and for all we know a lot more of the leading railroads. A wise and interesting and exceedingly active business man, whose wealth is said to be stacked away in kegs. Look at this paragraph concerning his present situation—taken from a standard reference book:

Trustee Amherst Coll., Hampton Normal and Industrial Inst., Met. Mus. of Art, N. Y. Pub. Library, Children's Aid Soc., dir. Union Theol. Sem. V. P. New York Chamber of Commerce. Mem. Am. Inst. Mining and Metall. Engrs., Am. Geog. Soc., New York Zool. Soc., New York Bot. Gardens. Clubs: Metropolitan, University, Century, At-

lantic Yacht, New York Yacht (Commodore 1909-10), Seawanhaka-Corinthian Yacht (Commodore 1902-03), Alpha Delta Phi, Down Town.

And so on and on. All of which is merely preliminary to saying that when you read about the proposed consolidation of the Great Northern and the Northern Pacific you are close upon Mr. James' heels. When you hear that the Western Pacific and the Denver & Rio Grande Western and a branch or two, the Moffatt tunnel and the Burlington are about to create a new, shorter and very attractive route to the East from the Pacific Coast, or the other way around if you prefer it, you are close to Mr. James again. The fact that the gentleman owns parts of all the several roads likely to be affected by such lively competition needn't worry you a bit. Competition is necessary. You can't offend Mr. James by going from one road to another with your business. He was there ahead of you.

The interesting little picture shown with this diverting tale was made one day last summer when Mr. James and Mr. Budd visited the 7-mile tunnel the Great Northern is cutting through the Cascade Mountains.

Leaving the Company Flat

After you've worked several years for a man without a growl out of him—or anything else—is it a good idea to slip into his office some morning, and gently remind him you are about due for promotion? A fine problem to think about, and very important, too, because if your approach work is faulty you're very likely to find yourself on the beach looking for a job, as Shakespeare said. Don't get the idea you're leaving the company flat on its back when you quit. You may have done good work and you may have set a precedent rather difficult to repeat, but no man is indispensable. Somewhere there is someone just as smart, and probably a little smarter. So, it's mighty important to know just how to go about this business of getting a promotion or a salary increase. You must understand the boss and his ways.

On this point L. M. Downs, president of the Illinois Central R. R., was quoted not long ago in the American Magazine as saying: "As I went along from job to job, I gradually learned that promotion was a thing I had to look for on my own hook; I couldn't leave it entirely to the boss. Get

President White of the Central R. R. of New Jersey.

that in mind, for it's one fact that matters. Promotion isn't wholly the employer's affair—it's a man's business to bring himself to the employer's attention, quietly but successfully, as one worthy of promotion."

Commenting on this philosophy, Merle Crowell, the editor of the magazine, who is a rather keen student of human beings, says he is glad Mr. Downs said "quietly." He adds, "Dramatic and silly methods of attracting attention frequently bring disaster to an employe whose ambition has more voltage than his judgment. Because you see no sense in being a wallflower you don't have to become a purple and prickly thistle. Midway between the two extremes lies a happy medium. Wise is the man who knows its boundaries."

"When I was a boy," said a widely known executive one day, in the expansive loquaciousness following a good lunch, "we had an old gray mare on our farm that was the family standby. She had given us a lot of fine colts, and in return we let her roam around the place without working most of the time. But when the rainy season came and the roads were bad we had to use her. She was a good puller. She could be depended upon to get us to town and back again. She was our bad weather friend. When automobiles came along, however, we bought one or two and a truck, and the old mare was used no more. After a while she died."

Railroads are the old gray mares of 1927. "I have looked forward," said R. B. White, the young president of the Central Railroad of New Jersey, not long ago, "to a time when the communities we serve would look upon us as one of their business concerns, one of their big industries, one of their big taxpayers, and a citizen of the town; that when the people of a town were thinking of their important business concerns they would also include the railroad, instead of thinking of us —as I sometimes fear they do— as something that merely passed through and from which certain services were expected.

"I have hoped that we might have a neighborly railroad, and by that I mean that we ourselves could be a good neighbor—so much so that in case of trouble, fire, flood, or plague, you would instinctively turn to us for help and assistance, and by reason of our equipment and plant we could respond in a most satisfactory way."

"Above all others, the United States today is a railroad nation," says Charles H. Markham, chairman of the board, Illinois Central

R. R. "The people owe more to the railroads than the people of most countries do, because the greater part of our existence and growth as an independent nation has been coincident with the railway era. Today, with only about one-sixteenth of the world's land area, we possess in this country approximately one-third of the total railway mileage of the world, and our railroads lead those of all other nations in the high quality and low cost of their service.

"Our nation today is the richest and most advanced nation of the world. It has become so largely because it has enjoyed for nearly a century a form of transportation excellently adapted to its great distances and its wide variety of products. Because of cheap and efficient railway transportation, available in all parts of the country, the products of all regions today are to be obtained in every region. The products of every region can be and are marketed in all regions. Passengers are moved long distances with great rapidity."

The esteem in which Mr. Markham is held both by the people who serve the Illinois Central and by the people whom this railroad serves was signalized in a remarkable celebration held in his honor at Paducah, Ky., June 15. The climax of the celebration was the unveiling of a bronze bust of Mr. Markham which had been set on a shaft of granite and erected in the parkway at the entrance to the office building of the Illinois Central's new shop plant.

The bust and pedestal were purchased out of a fund made up of approximately 2,400 small contributions from employes of the Kentucky division and citizens of Paducah, and the joint nature of their enterprise marked the entire celebration. Arrangements were made by a committee having co-chairmen, Master Mechanic C. M. Starke for the employes and H. L. Meyer for the townspeople. The famous Illinois Central Shop Band furnished music under the direction of General Foreman A. J. Leutenmeyer; the dedicatory speech was delivered by J. C. Utterback, Paducah banker.

It was a great day in Paducah. The papers ran special pages and eulogistic editorials. Railroad men, officials and the rank and file contributed to the occasion, and of course there were speeches. But nothing, perhaps, could be more impressive, not even the very finely sculptured bust, than the terse rec-

C. H. Markham, Chairman, Ill. Central R. R.

ord of Mr. Markham's career in railroading:

1875, left school at 14 to get a job. Got one.

1881, began railroading as a section hand.

1881, six months later, employed as a station helper on the Southern Pacific at Deming, N. M.

1887, promoted to station agent. Devised means of increasing car capacity.

1897, promoted to general freight and passenger agent.

1901, vice president, Houston & Texas Central.

1904, vice-president and general manager Southern Pacific.

1904, quit railroad to become general manager of the Guffey Petroleum Co.

1910, president of the Gulf Refining Company.

1911, became president of the Illinois Central R. R.

1926, resigned to become chairman of the board.

There is a perfectly beautiful theory abroad in the land that virtue is its own reward, but like many another theory, it doesn't always work out. Many a man has given his life to business organizations faithfully and loyally, working like a pack horse year after year, until he passes the top of the hill and begins to slide a bit toward the bottom, and when this happens only one old time bromidical platitude sticks in his mind, and this is that helping to build up some men's fortunes is Love's Labor Lost. The most pathetic tragedy in business today is the promotion of "new blood" over the men who made the enterprise a success and slowed down toward the end. Necessary, perhaps, but pathetic.

Another theory which has its chief supporters among those who have already made their pile, insists that no good man ever is overlooked. This theory works out successfully just often enough to keep it alive, and that's all. "I don't believe in the shrinking violet," said a railroad president one day, talking to an old acquaintance who had congratulated him on his success in getting on in the world. "I've always noticed that the shrinking violet wilts rather early. If I hadn't persistently kept myself out where the boss could see me I never would have made any headway. I did my work. For awhile I lived on the theory that no complaints were as good as praise. But this didn't get me anywhere. I began, then, to plan so that when something really important was to be done the old man had to send for me. I didn't beat a drum, figuratively, but I began to see there was a lot of sense in old Ed Howe's philosophy that if you don't stick out in front, if you don't make a little noise, no one will know you're around. Of course a man must deliver the goods. If you have no thoughts except about the pay car and the clock you'll never get anywhere worth while. But don't forget you might work for some perfectly decent men until you're 95 years old and never get a thing. Just as long as you'll submit, some men will impose on you."

Some men would rather be praised than paid, and increasing your pay is the only way some employers ever give praise. "I worked for one outfit for ten years," said a visitor one morning not long ago. "In all that time not a man ever patted me on the back and told me I had done well in my work. But in those ten years I had eight salary increases."

So perhaps it's all a matter of differences in men and methods.

It Certainly Pays to Think

The man with ideas, curiosity, determination and faith, much faith, is almost certain to win. In a recent number of Doorways Magazine which, unfortunately, isn't seen by many young men, tells this encouraging story of Charles F. Kettering, vice president and research executive of the General Motors Co.

Only a few months ago, the story goes on, finish was one of the biggest problems in the automobile game. It took the manufacturer 37 days to paint an automobile. In three days the paint job could be ruined and frequently was.

Then the public demanded the closed car, with its great area of smooth surface—and the problem became a catastrophe.

Charles Kettering began to think about paint. He called together a group of leading paint men, and said to them, "The paint job on an automobile is not satisfactory, and the process takes too much time. What can be done about it?"

Mr. Kettering thought the quality of the finish should be improved, and the time required for the job cut to one hour. Impossible, said the wise paint makers. Paint wouldn't dry fast enough.

One day in New York, some pins displayed in a jeweler's window attracted his attention. They had a lustrous, hard finish.

The jeweler did not know much about the finish—referred him to the manufacturer. The manufacturer told him the finish was lacquer.

He said, "I want to buy some."

They said, "What do you want to use it for?"

"I want to paint an automobile door with it."

They said, "You will never be able to paint an automobile door with it."

"Why?"

"Because it dries too fast."

This proved to be true, but for two years Mr. Kettering experimented with this one lacquer. Then, once more, he called in the paint wizards.

"Before we sit down to lunch," he said to them, "I want each of you to pick out your car from this lot of unpainted automobiles and to select from these sample finishes, the one you want put on the car."

They humored him.

When the lunch was finished, he said to them, "Your automobiles are ready to drive away."

And it was so.

When some of them thought they would rather have the finish the other fellow had selected, he refinished their cars for them in 15 minutes.

Charles F. Kettering's brain is insured for four million dollars by the General Motors Company.

How much is your brain worth to your employer?

Learn to Laugh

It is said that Lincoln kept a book of humorous writings on his desk during the darkest and most perilous hours of the Civil War. To the members of his cabinet he would read aloud from this book, and say, "Gentlemen, why don't you laugh? With the fearful strain that is upon me night and day, if I did not laugh, I should go mad!"

Learn to laugh. It is better than medicine for the body. It gives the weary mind a holiday, freshens the spirit and tips the peaks of life with light.

A hearty laugh stirs up the blood, expands the chest, sweeps away the cobwebs from the brain and electrifies the whole system.

Why Not Use Machine Guns?

Fortress-like concrete pillars are to protect some of the traffic safety islands in the most dangerous of Paris streets. Badly driven cars have so often wrecked lamp posts and hurt people on these refuges that the city traffic commission has decided that solid masonry is the only adequate protection.

Missouri-Pacific Station at Hot Springs, Arkansas.

Hiring A Man to Make Claims

A Traffic Manager's View

By Carlson B. Pirie

IN THE history of industrial traffic management a situation has grown up which tends to hinder rather than to advance the traffic manager in the eyes of his employer, and retard the recognition of traffic management as a worthy profession. When any small business grows to that point where the owner realizes or can be shown many leaks or transportation failures occurring in his business daily he hires a traffic manager. Generally he pays this employe to make as many claims on the carriers as the new man is capable of finding on damage, misrouting, or overcharge on inbound or outbound goods.

As time goes on the only tangible way this employe can show the boss what he is accomplishing is to report the number and amount of the claims he makes and collects from all carriers. Both the traffic manager and the employer grow indifferent to this report except that when there is a decided increase, instead of seeking causes with a view to prevention, the first thought that comes to the traffic manager is that surely he is entitled to a raise in salary, and to the employer that the traffic man is entitled to it. Very seldom does the employer see the danger and ask, "Why can't we prevent these leaks in business, and send out or receive all goods perfectly, without damage or overcharges?" It seems impossible to make the average merchant see this truth. The transportation advisory boards could cure the situation in less than two years if interest was aroused nationally among business men in prevention work.

The owner of a business must understand it is good business to conduct supervision of traffic in such a way that, if possible, there will be no claims of any kind. There are a few industries whose shipments are so well packed, so accurately described, so easily loaded, so safely transported by rail, water, or truck that invariably they arrive without damage, but not always without overcharge owing to the errors of the carriers. "The Last Frontier of Waste" is the way editorial writers are now talking about shipping and receiving departments of industry in the United States.

The Proper Way to Pack Your Outboard Motor If You Expect to Use It Again.

The average employer has seen the importance of his sales manager, his credit manager, his advertising manager, but seldom his traffic manager. It is not supposed to be necessary for the traffic man to attend sales meetings, price meetings, or credit meetings. The only reason for this is that this official has not sold himself to the firm by which he is employed, or does not see his chance to cooperate and help every other department in the business. Equally sad, the other departments have not been taught what a wonderful oiler and helpmate the wise and experienced traffic manager can be to them. Who can bring them together? Only the proprietor who accepts the axiom that there should not be any transportation failures if his traffic man is efficient, and the equally important vision of how necessary the traffic department is in keeping in perfect continuous balance every other department of his business.

It is apparent that not many owners or executives of commercial plants give the traffic department its proper place and consideration in the commercial world. If they have a competent traffic manager with vision, ambition, wisdom and a pleasing personality, he will actually control the buying, the selling, the advertising, help the credit department, and supervise the shipping department, the receiving department and the warehouses. He will produce the gross profits to which the firm is entitled by claim prevention, have very few returned goods, be widely known to all rail, water and truck carriers, his employer will urge him to take an active part in civic life, and he will belong to his transportation club and transportation advisory board.

However, traffic management is rapidly assuming its proper place as a profession. All branches of education are furthering a nation wide campaign to acquaint business men with the importance of this department in all industries large enough to need such supervision. Instead of rushing to a

railroad office and stealing a rate clerk for a slightly higher salary, which is done in the majority of cases, an employer should choose this employe with as great care as he would in employing a sales manager or purchasing agent. A competent traffic man, when hired, should be given every help to install an economical, efficient system suited to the individual business under question, and this system should not be allowed to fall into a rut of thought and action as many of them do.

Every complaint relating to traffic should receive sympathetic attention from the traffic manager. After being handled to the entire satisfaction of the customer, the carrier, the fellow-employe, the executive or the traffic man himself, the complaint should be analyzed carefully for causes, and the traffic manager should put into force methods which will, if possible, forever prevent that particular kind of complaint or claim from arising again, or, at least, to keep such claims at the lowest possible minimum.

The majority of employers and traffic men do not take prevention into consideration. Usually they regard handling of losses, complaints, and overcharge as a mere detail incident to business and, therefore, of no more consequence than any other daily annoyance to be absorbed into overhead without ascertaining the cause. They simply salvage the costs by a claim on the carriers.

Did you ever wonder where the profit goes? Is there any profit to your firm on a claim? The employer should hire a traffic man with the understanding that he is just as much of a producer as the purchasing agent or the sales manager. None of the three can function correctly unless all cooperate 100 per cent every day. The employer should tell his traffic manager that one of the most important profit-makers is prevention of losses, damages and overcharges; and that if his system of traffic is really efficient, it will not overlook any claims but will always seek to prevent a repeater.

Contact of traffic managers with buyers or chief purchasing agents is vital in prevention. If the firm is wise, every purchasing order, without exception, will arrive at the traffic desk with the routing and packing instruction blank to be filled in by the traffic department. All the details of timely

The Proper Crate for Heavy Ranges. Three Long Diagonals.

delivery, economy in the freight charges, prevention of any kind of overcharge, misroutings, delays, losses, and damages lie in the words typed in by the traffic manager as to the proper routing and packing for any shipment whether less than carload, shipload, or trainload. A shipment properly routed, marked, packed, described, and delivered in good order to a carrier is half way to destination without any losses, tracing, or expenditure of extra thought, care or worry by the buyee. The proper choice of a carrier based upon experience, claim prevention, prompt payment of past claims, frequency of movement, and all other factors known to the traffic expert are the most important insurances of a shipper's business. This is better than following the purchasing agent's whim, personal friendship with the salesman, or worst of all, when the president of a firm himself gives arbitrary routing of the largest orders to his selling friends without the cautions and previous advice of his traffic manager.

A cordial, cooperative, mutually dependable contact between the buyers and the traffic department is the most important factor in any business and should be insisted upon by the owner as imperative. It cannot be emphasized too much throughout all business or by teachers in universities to the young traffic student who will be the future business executive or traffic manager. Otherwise, why hire a competent traffic manager?

A busy buyer cannot know too much about traffic, but how can he keep up with the thousand and one things a good traffic man has to read and study every day to be able to advise the buyer correctly? Rates are altered, packing requirements change, laws and decisions change. Everything in transportation is constantly on the move. The purchasing agent has enough to do to be able to take care of his own studies of commodities to be bought and to be required, besides supervising its shipping and delivery. It does not matter how fortunate a well thought out purchase from a distant point may be, it cannot enter into legitimate competition at destination until transported safely with lowest rate possible, without loss, damage, or overcharge to diminish the gross profits expected.

The lowest rate is not always the best rate. Usually the cheapest rate is offered by the worst carrier, or it is not nursed along and delivered on time safely by the best rail carrier. Therefore, the interrelationship between buying and selling is important.

After the merchandise has been received, is the purchasing agent through? No. He has to contend with returned goods. If the returned goods are defective and credit can be obtained from the shipper all well and good, but any other reason for such return generally is the fault of a poor traffic manager who has not considered his outbound business as important as his inbound supervision and system.

After receipt of goods, before the sales manager can make the final turn over, the goods must be repacked securely, re-marked—all old marks being previously erased—rebilled correctly, possibly taking an entirely different classification from that on which it moved from shipping point. Then, after again being delivered to a local carrier's station in good order, the traffic manager has completed the second leg of his work, at least for a jobbing house. His choice of a final delivering carrier is almost as important as his first routing was to obtain the goods. Now he has behind him all of the conscientious efforts of the manufacturer, jobber, and the first carrier. If he fails now, he will destroy wholly, or in part, all of this past protection by his error in judgment. A wise choice of the final driver, truck company, or rail carrier, to handle a risky proposition can be learned only through experience. But, again, the lowest rate is not the best. Only the highest type of care plus a reasonable rate should be considered.

Continuous study and the placing of your business with the proper carrier will build up the efforts of a sales manager and his men. A traffic manager sometimes cannot carry out wild promises of a high power salesman and perform miracles; but, with experience, he can give perfect satisfaction to the customer, and to a reasonable salesman who knows just what he can safely promise and what the house can make good on delivery.

Most shortage claims are the receiver's fault for not carefully scanning all packing, or having an air tight receiving system. The greatest number of damage claims are the fault of the shipper for shipping goods in poor containers, strapping, or car blocking. Generally misrouting claims are the fault of a shipper in not marking cases to agree exactly with the bill of lading, and also not showing routing on the package.

When both traffic men and their employers agree that it is good business to advise all shippers of the apparent causes of claims to prevent them in future shipments, then business will begin to thrive and enjoy gross profits in full without unnecessary overhead.

Mr. Hoover's federated engineering societies on the study of waste in industry decided that 50 per cent was due to management, 20 per cent to labor, and the remainder to miscellaneous causes. A mistake in traffic management may waste ten times as much as a workman's failure.

A Rainy Day Railroad

The Associated Press gravely informed the world, July 28, that the railroad running out of Kane, Pa., has decided to stop handling freight except when it rains.

The road operates over a distance of 20 miles through dense forest lands. Some time ago it was found that locomotives, throwing off sparks, caused forest fires and the road posted a passenger schedule containing the sentence:

"These trains will operate only on rainy days."

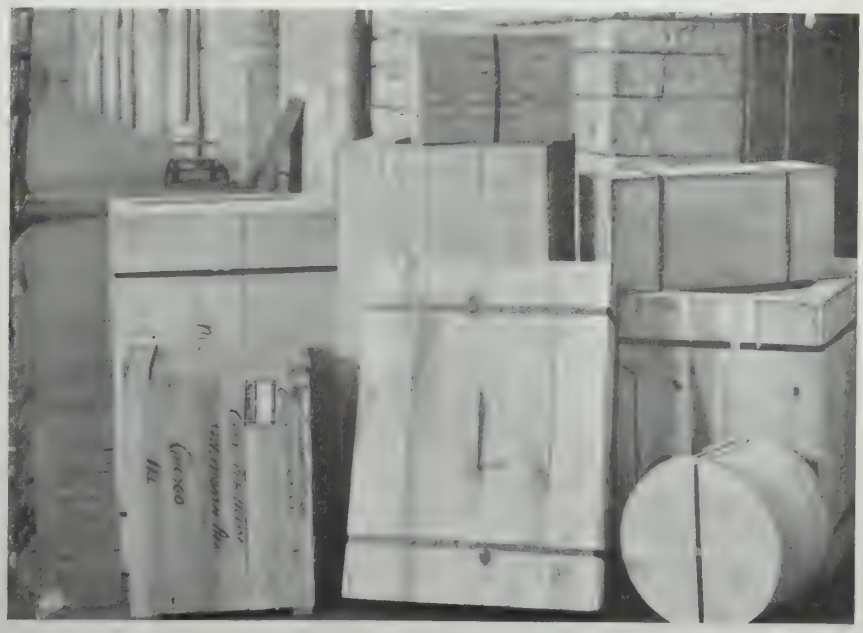
The system proved unsatisfactory to patrons and the passenger problem was solved by using a gasoline car.

The Miracle of Service

"The railroads," said W. G. Shepherd in Collier's, the National Weekly, not long ago, "are America's delivery boy. Hardly any commercial deal can be completed without his services. He has gone to business school; he knows exactly where he fits into American life; he knows to a T what is expected of him. He is not only spending all that he can afford of his earnings to spruce himself up, but he is also borrowing money by the billions to improve himself and prepare himself for an even greater future."

Mr. Shepherd compares the situation in 1905, when a bumper wheat crop was produced with that in 1926 when a similar crop resulted; in 1905 the railroads' service broke down, and "Nature's friendliest smile had been offset by the failure of the railroads to do their part," but—in 1926,

"More than 1,000 car loads of wheat were moved out of Kansas every 24 hours, and this gigantic task was accomplished daily for fifty days! All records for grain movement over such a period of time were broken by 84 per cent. Here's an amazing difference between 1905 and 1926. It is a difference that has cost over four billion dollars."



Metal or Wire Tie Bands Keep Boxes From Falling Apart, and Prevent the Making of Claims.

What the Papers Say

IN Chicago last Sunday 13 persons were killed outright or fatally injured in automobile mishaps. The chief comment was simply that it was the largest number of such deaths ever recorded in that city in a single day. Apparently the public has come to making allowance for a certain number of automobile fatalities daily. It is scarcely news unless the casualties of a day are exceptionally numerous.

For contrast of the dangers of automobile traffic and railroading we need only to reflect upon what the feeling would have been if the 13 killed in Chicago on Sunday had been victims of a train wreck. That would have claimed country wide attention. The number of fatalities on American railroads in 1926 was 6,706. The total dead by auto mishaps numbered 22,500.

Americans have still to master the automobile; carefulness in operation is the main essential.—Pittsburgh Post.

Super-Transportation

Our new transportation service has been more effective even than the federal reserve system in taking out of business a considerable part of what was once believed to be the inevitable element of gambling in business. The buying public has discovered that it need not fear seasonal congestion, wide fluctuations in prices, car shortages and all the other things that found root in inadequate transportation and that necessitated inventory gambling against the future.

Merchants once made their principal purchases twice a year, and made them early enough so that even floods and embargoes would not interfere with their having necessary goods to meet trade demands. Today every element in business understands that goods can be moved with certainty from the most remote parts of the country to the rear door of a shop within a comparatively few days.

We have the railroads to thank for much of the stability of business that is usually credited to other factors in business.—Chicago Journal of Commerce.

Good for Each Other

The automobile, rightly considered, is a good feeder to the railroad, and, conversely, the railroad is a good feeder to motor transportation. Each has characteristics which make it best suited for certain kinds of traffic. Railroads in more congested areas, aware of this, have gone into the motor transportation business themselves, using the railroad terminals for their new motor business. Neither business has hurt the other. If anything, both have profited.—New Philadelphia (Ohio) Times.

Once Was Enough

The American people still remember with something akin to shuddering our experiences with government control of railroads, made necessary at the time, its proponents declared, by the war emergency.

This unpleasant experience had at least one beneficial effect. It set back any drive for government ownership of railroads for at least a generation.

The national transportation system is on a sound basis once more. The people want no more experiments in government ownership or control.—Wilmington (Del.) Journal.

It's the Only Way

Humanity in this age will simply have to get into the habit of being careful all the time. The extent to which casualties are kept down when we are forced to be careful adds to the terrible reproach upon us for the wasting of life where there should be comparatively little danger. Carefulness is the only way to keep down casualties.—Pitsburgh (Pa.) Post.

First Great Railroad Strike

Fifty years ago this week (July 16, 1877) the first great railroad strike in the history of the country was in progress, a strike which resulted in the tying up of several of the largest transportation systems, the loss of many lives and the destruction of millions of dollars' worth of property. . . .

Looking back half a century, we are impressed by the thought that conditions have decidedly improved; that there is a far better understanding today than there was then between capital and labor; that each now recognizes that the other has its merits and its troubles, and there is far more of an inclination on the part of each to meet the other half way. Laws have been enacted for the purpose of avoiding labor troubles on our transportation lines, but we have long had a feeling that the improvement in the matter of handling railroad labor disputes is more due to better understanding than to law; that both sides are better officered in this regard, and that both are showing alike more consideration and more intelligence.—Marion (Ohio) Star.

Wide horizons tend to enlarge the mind; limited horizons, on the contrary, circumscribe it. Stagnant water is not inclined to flow; the wind, instead of rousing it to life, simply irritates it. It is the hatred of narrow minds for liberal ideas that fetters the march of progress.—Victor Hugo.

"Curses! Where Are Them Papers?"

A Tragedy in Filing

By Max G. Winkel

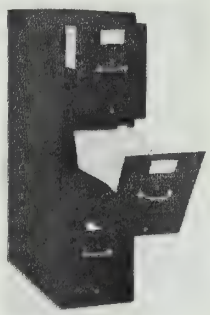
C. St. P. M. & O. Ry.

BACK in the good old days when melodrama was served raw the missing papers were a favorite theme. I still recall how the chills ran up and down my spine when the villain hissed, "Curses! Where are the papers?" Modern writers seldom resort to this idea now, but in many railroad offices the boss still growls, "Curses! Where are them papers?"

Despite the efforts of the efficiency gents and office supply salesmen, papers still go astray. Filing work in railroad offices has not had the attention it deserves. With a little effort I believe the bugaboo of missing papers could be eliminated, and in view of the fact that railroads, as now organized, must be conducted almost entirely by correspondence, it goes without saying that this effort should be made. With records and papers of all kinds piling up day after day, and year after year, some thought must be given to the future or the time will come when railroads will be buried under a mountain of their own files.

To say that a good filing system is a first necessity in any office seems a platitude, yet there are many railroad offices where this news has apparently failed to penetrate. In some offices filing difficulties are accepted as a necessary evil. In others the clerks are aware that improvements could be made, but lose so much time looking for needed correspondence that they haven't any left for the improvements.

Almost every department head is willing to concede that the other departments should have no great difficulties in establishing a simple filing system, but in his own department, Ah! That's different! "We have so much correspondence," they will say, "and so many subjects." The real reason is they prefer to suffer the little troubles of unfound correspondence, rather than tackle the job of putting things in order.



With a good filing system and a good file clerk to operate it, there is little reason for papers going astray. Or perhaps we should turn this around; the good file clerk should come first and he can install a good filing system.

The operator probably is 75 per cent of any system, good or bad. A good file clerk will get along with poor equipment or a poor system, while a poor clerk will be unable to keep things in order with the best equipment obtainable. No matter how much effort has been made to install a good filing system, an inefficient operator, if left alone, will be able to mix it up and wreck it thoroughly in 30 days.

The first requisite, then, is a competent file clerk. Some office managers seem to think filing is a simple matter, and can be done by anyone in the office, during odd moments when nothing more pressing occupies their attention. This may be true in some offices, but I have yet to find a railroad office which can operate successfully in this way. A large per centage of the human race, even among experienced office employes, are not fitted for filing work.

The most important requirement for a good file clerk in a railroad office, I should say, is a very thorough knowledge of the railroad itself, the operating methods and organization, and an understanding of the special and technical terms used in railroad work. A clerk who does not understand the difference between per diem and demurrage or who thinks a motor car and an automobile are the same thing, is very likely to mix things if given half a chance.

I am reminded of the story about the chief clerk, who, in the absence of the file clerk, was trying to find some correspondence about two steers killed on the right of way. He was unsuccessful and had to wait until the girl returned, whereupon he asked her where she had filed it. "Why," replied Miss Files, "there's only one possible place—right here under 'Dead Freight.'" I also heard of a new stenographer who thought the boss was spoofing when he started dictating a letter about a 75-pound frog; she knew they never grew that big.

These jokes may be fabrications but there are plenty of file clerks whose ideas of filing are just as hazy. As an experiment put your stenographer or file clerk through a short catechism on railroad terms; see whether he knows what is meant by switching reclaim, the 16-hour law, a 36-hour release, or punitive time. A clerk who does not understand what the latter is about will have a hard time filing it properly.

The second qualification neces-

sary is a sense of system. Some persons are naturally orderly in everything they do; their desks or personal belongings are always in order; never any searching for missing things. They have a place for everything and everything in its place. Such persons may be good file clerks. Others are just the opposite. Everything about them is in constant disorder. They spend half their time looking for things they have mislaid. Needless to say, a person who is disorderly in other things is not likely to change his habits in handling files. A sense of system and order is more or less a matter of early training and habit, and is an asset in any line of work, but in office work it is especially important.

A good memory is the next thing to look for. Remember the man in the advertisement who recognized Mr. Addison Sims of Seattle? That's the kind of a man to get for a file clerk. The gents who write the ads tell us that anybody can develop that kind of a memory, so why be satisfied with less? While I don't know whether these memory systems are of any value, never having tried one, I do believe that training the memory is not such a very difficult matter. In my opinion memory and interest go hand in hand; in other words, the memory retains only the things in which we take an interest. People who interest us we remember easily; stories we enjoyed we remember; baseball fans can remember the batting averages and records of their favorites with surprising ease. Correspondence in which we take an interest will be as easily remembered, and, as a rule, quickly found if wanted again. If your file clerk takes an interest in his work and is a real honest-to-goodness railroad man, he will not need any course in memory training.

Two other qualifications which a file clerk should have are neatness and thoroughness. They are indispensable. Sloppy work should not be tolerated under any circumstances.

Along the St. Croix River Near Hudson, Wis.; Chicago, St. Paul, Minneapolis & Omaha Railway.

It would be difficult to outline a system which would be used in any office, or even for a particular office, without knowing in detail the work handled by that office. Some filing equipment manufacturers offer to devise and install filing systems for purchasers of their equipment but I doubt whether this is always successful. Their so-called "experts" may devise an ideal system, but as most correspondence is handled in a manner far from ideal, it might not be practicable. A man who has worked in the office long enough to be thoroughly familiar with the business and the manner in which it is handled, might be more capable of devising a good system, after studying the principles of filing work.

There are many systems for filing, varying from a straight numerical or chronological system to intricate subject, or "decimal" systems. For filing claims, for instance, a straight numerical file would suffice. The first claim would be No. 1, the second No. 2 and so on indefinitely. A card cross index showing the names of the claimants alphabetically, with a reference to the claim number would be helpful, and usually is provided. In the traffic department where many requests for rate quotations or other information are received an alphabetical file can be used. This usually consists of a set of folders, divided in various subdivisions of the alphabet, and correspondence is filed in the appropriate folder under the name of the person addressed. Folder files or other loose leaf filing systems are not as a rule very satisfactory for filing correspondence which must be saved and frequently referred to, and their use should be limited to files of minor importance. Cross indexes are not usually used with folder files. In some offices a geographical arrangement of files will be found most convenient, filing being done under the station names arranged alphabetically.

In most offices the job is not so simple however, and a more elaborate system must be provided. In this case some variation of the so-called "subject" system will be found most satisfactory. By subject filing is meant placing all correspondence relating to one subject on one file or group of files, depending on the volume of correspondence. The subjects will depend of course on the work handled in the office, and can be arranged alphabetically or in some arbitrary order to suit require-

ments. File numbers are assigned to each subject and subdivisions are indicated by a decimal point or hyphen, followed by a second number, and sometimes a third. The first number would then be the subject number, the second would indicate a subdivision of the general file, and the third would be a further subdivision.

As an illustration I shall outline a grouping of subjects for filing in an executive or operating office. This grouping is based on the departmental plan of most railroads, and the subject numbers are arbitrarily assigned, allowance being made for expansion by leaving a block of numbers vacant between the different divisions.

This list of subjects would be incomplete for some offices, and others probably could eliminate some of the subjects. Trackage, for instance, might be divided, and a separate subject number assigned for yard tracks, industry tracks, passing tracks, rental of other line's tracks. These numbers would be the main, or subject numbers. The subdivisions of each subject would be taken care of by placing a decimal point or hyphen after the first number, and adding a second number. To better illustrate my meaning I show a theoretical grouping of all the files under the subject "Highway Grade Crossings" subject No. 43. (Table on next page)

	File No.	Subject
Executive dept.	1	Employes, employment, appointments, organization matters.
	2	Wages and working conditions.
	3	Reports and statistics.
Operating dept.	10	Improvements and maintenance.
	11	Trackage matters.
	12	Track material.
	13	Station facilities.
	14	Stockyard facilities.
	15	Coaling facilities.
	16	Hotels, eating houses.
	17	Joint facilities.
	18	Mail.
	19	Express.
	20	Train service and time car matters.
	21	Train rules and operating matters.
	22	Accidents, injuries, safety first.
	23	Switching and interchange.
	24	Car service, per diem.
	25	Water supply.
	26	Ice and ice houses.
	27	Gas plants.
	28	Fuel, fuel conservation.
	29	Free transportation.
	30	Government matters.
	31	Snow plows, snow fences.
	32	Fires and fire protection.
	33	Explosives.
	34	Storms, washouts.
Engineering dept.	40	Buildings and structures (other than station facilities)
	41	Elevators, warehouses, docks.
	42	Track scales.
	43	Highway grade crossings.
	44	Bridges, trestles and culverts.
	45	Drainage matters.
	46	Tunnels, retaining walls.
	47	R/W signs, fences, cattle guards.
Mechanical and car	60	Shops and enginehouses.
	61	Tools and machinery.
	62	Coach yards, car repair tracks.
	63	Rolling stock, general.
	64	Locomotives.
	65	Cars.
Traffic	70	Freight traffic, car distribution.
	71	Transportation charges, rates.
	72	Demurrage and storage.
	73	Advertising, solicitation.
Legal and claim	80	Laws and legislation.
	81	Claims
	82	Freight claim prevention.
Accounting	85	Accounts and records.
	86	Valuation matters.
Purchasing dept.	90	Material and supplies.
Telegraph and signal	95	Telegraph and telephone matters.
	96	Signals.
	97	Automatic control.
General	100	Land and R/W matters (sewers, paving, rental of R/W, sale of land.)
	101	Insurance.
	102	Taxes
	103	Associations and clubs.
	104	Health and sanitation.
	105	Other companies and individuals.

It will be seen that this allows almost unlimited expansion. If a file gets too bulky it can be subdivided to suit requirements. For instance, file 43-7, "Bell and Wigwag Signals" could be subdivided to provide a separate file for each different type of signal in use, another file for maintenance, inspection. On the other hand, some offices might have very little correspondence regarding highway crossings, and could do with a single file numbered 43, putting everything regarding signs, signals and maintenance all on the same file. However, it is best to keep each file as small and distinct as possible, to avoid digging through a bulky file to find a letter.

In addition to these general files it often is convenient to have a similar set of files for each station on the line. This is done by arranging the stations in alphabetical order and assigning a number to each, starting with 200, and leaving a block of numbers vacant between each letter of the alphabet, to allow for new stations. In the station files the second number would be the general subject number, and a third number can be used if a subdivision is necessary. To illustrate, station numbers might be assigned as follows:

200 Aberdeen
201 Acton
202 Adams
203 Afton

A file for station facilities at Adams would then be numbered 202-14, the first number being the station number for Adams, and the second number the general subject number for station facilities. If there should be two stations at Adams, a freight and passenger station, for instance, the file for the freight station would be

202-14-1, and for the passenger station 202-14-2.

Many of the station files would not need a file for each subject, and files should therefore be made only as needed; new files being added as the necessity arises. The numbers never will be consecutive in a file of this kind, but this should cause no difficulty. If desired a separate list of all files can be kept, so as to be able to check up if any files are missing. A card cross-index should also be kept, as an added safeguard.

43	Highway crossings; general correspondence.
43-1	Laws re. width of, protection.
43-2	List of crossings; showing protection.
43-3	Private crossings; form of agreement covering. Standards for private crossings.
43-4	Inspection of crossings, signals and signs.
43-5	Crossing gates.
43-6	Standard planking for crossings.
43-7	Bell and wig-wag signals.
43-8	Crossing signs—General.
43-8-1	Crossing signs—Standard adopted by Wisconsin.
43-8-2	Crossing signs—"Stop" signs required by Minnesota.
43-8-3	Crossing signs—Standard advance warning signs of Iowa.
43-9	Removal of brush, trees, to provide better view of crossings.
43-20-1	Maintenance of crossings—general—1921.
43-20-2	Maintenance of crossings—general—1922.
43-20-3	Maintenance of crossings—general—1923.

This outline is for a permanent file. Most offices will have some kind of temporary or "hold" file for correspondence awaiting replies, and perhaps a "junk" file for circulars, letters or other papers which are of no value and not worth keeping. Every office has its own way of handling correspondence, and these auxiliaries to the filing system can be designed to suit requirements.

Some of the important points to consider in designing a filing system are enumerated.

1. All files in an office should be included in one system, and in charge of one person. If possible, everyone in the office should be familiar with the system, but one person should have absolute charge, and should have complete authority on all matters pertaining to the manner of handling correspondence and filing.

2. The system adopted must allow for unlimited expansion and must also permit weeding out of obsolete material without too much trouble, and without disrupting the system.

3. Important papers must be carefully filed and indexed so they can be found quickly and easily, if needed. Unimportant papers, which, after being filed, probably will not be needed again, should be filed with a minimum of effort. Bear in mind that the more unimportant stuff there is cluttering up the files the harder it is to find the important papers. Experience must decide as to what is important or unimportant.

4. The Interstate Commerce Commission regulations governing the destruction of records must be carefully observed.

5. Each file should cover a specific subject, so far as possible, and so-called "general" files should be avoided.

6. Written instructions should be compiled covering the filing work, for the guidance of file clerks and others in the office. These instructions should cover every phase of the job, so that, if necessary, a new clerk could get a good working knowledge of the filing system, without any other instructions.

Frequently the difficulty in finding files or papers is not the fault of the filing system or the clerk handling it. The real cause is the manner in which correspondence is handled by others in the office. Files and papers are often referred to other offices with a pencil notation of which no copy is made, and, naturally, the file clerk loses all trace of papers so handled. To avoid any trouble of this kind the file clerk should receive a memorandum of any files or papers sent out or given to another office. In large offices the file clerk should also have a record of all files or correspondence held by each person in the office for current use. In a small office the file clerk should have no difficulty in remembering what files each member of the force may have, but in any case, the file clerk should have access to all desks, in order to find papers in the absence of any one. Even a good file clerk does not usually possess clairvoyant powers and a little cooperation from the rest of the office force is necessary to keep the files in order.

Above all, the rule to confine each letter to one subject should be remembered by correspondents. If two subjects are so closely related as to make a separation impossible, a cross-reference should be made on each file concerned, or separate copies of the correspondence made for each file. A knowledge of the filing system will be a guide to correspondnts in this respect.

Another trouble is the "conference" habit. Instructions are sometimes issued verbally or in conference, and later someone who was not in on the conference gets out the file and finds some old instructions which may be all wrong, but being the latest there is he follows them, with disastrous results. Such things have happened. The best plan is to make a memorandum of all matters handled in conference, for the files. This may appear to be a lot of red tape, but memories are treacherous and a written record usually will be more trustworthy.

In the final analysis it will be found that the results obtained from a filing system will be in proportion to the amount of care used in handling the files. Everyone in the office should be impressed with the fact that the files are not temporary. To quote from a popular song, they are, indeed, "Not for just an hour, not for just a day, not for just a year, but ALWAYS!"

But Still We Have Horses

The old horse-drawn fiacre of Paris is getting ready for the museum. There are 51 of them left. Both drivers and horses show age and wear. In 1900, the year of the exposition, there were 12,529 of them. Those left are one-horse coupes with room for three thin persons on the seat and a narrow folding seat facing it.

Once in a long while some very aristocratic looking old lady or white-bearded gentleman of the old, old school, ventures out in an obsolete carriage, but traffic jams and smiles tend to make their appearances constantly rarer.

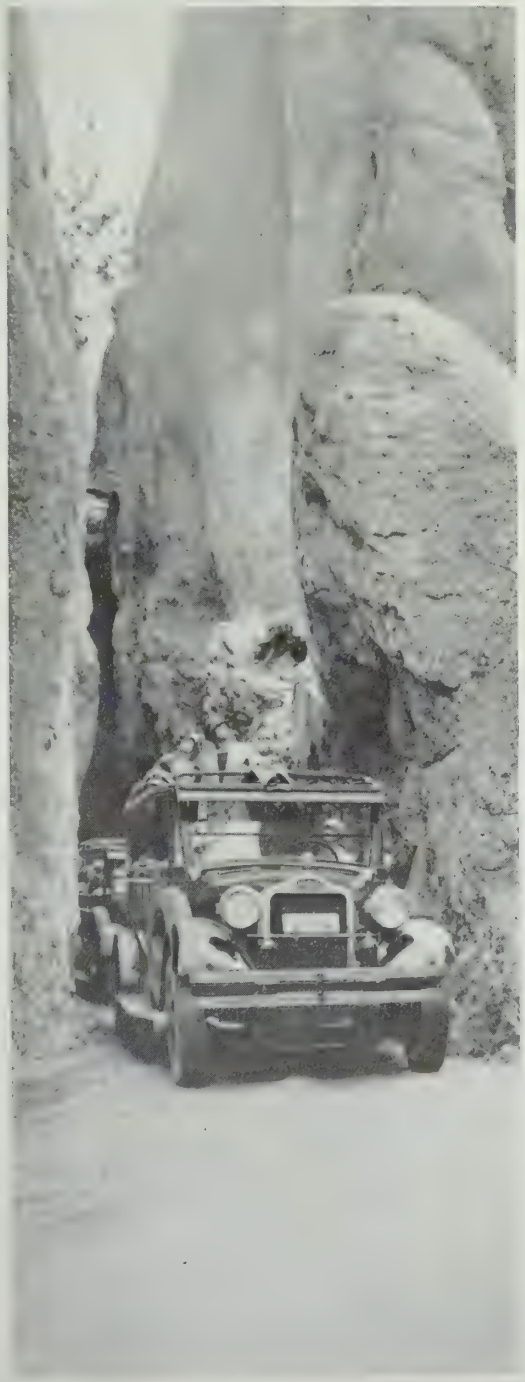
The Public Will Settle This Question

The Coming Transportation

By F. S. Scarr

ANY form of transportation which is economically justified is destined to fulfill its proper function, our selfish interest or narrow vision notwithstanding. We always have been prone, however, to forget the lessons of the past, and have in every instance neglected for a time the opportunities offered by advanced methods and devices. The brief history of the motor vehicle, and particularly its application to commercial needs, seems to indicate that we have again been obstructing the path of economic progress. Fortunately our unwise opposition appears to be near an end. Evidence on every hand points definitely to a better understanding between the old transportation order and the new.

The physical characteristics of the motor coach and the steam train naturally influence their economic relation. The motor coach is designed to handle small groups; it is highly flexible as to time of movement and route of travel, is not dependent upon rigid schedules, and approaches the convenience of individual service. The steam train is designed to handle large groups of passengers, it generally operates at higher speeds, and is confined in fixed schedules and routes.



Narrow Pass on Needles Highway in the Black Hills, South Dakota.

The cost of motor coach operation is considerably less than that of the steam train; the relation being approximately 30 cents a mile (total cost) for the former and $1.10 or more a mile (out of pocket) for the steam train. If, for example, there were 300 passengers to be moved at one time from Philadelphia to Atlantic City, the steam train would be more economical, as it would cost approximately $1.10 a mile as compared to $3 a mile for ten motor coaches. However, if but 30 passengers were to be moved, the economic choice would be reversed, the steam train costing $1.10 a mile against but 30 cents for the motor coach.

Combining the physical and economic factors, we find the lower unit mile motor coach cost permitting a three or fourfold increase in schedule frequency at the same total cost, bringing the highway vehicle to a point of convenience more nearly in accord with the private automobile. The relation which these two vehicles bear to each other seems to narrow down to the following:

The more economical vehicle is determined by the volume and flow of traffic. (Approximately 100 passengers to the trip being the dividing point.)

The convenience factor, generally speaking, for reasonable distances, completely favors the motor coach. Distance, as it affects convenience, necessarily varies in every instance, depending upon traffic, road and other conditions that influence the rate of travel as compared with the same movement by rail. Distance is limited only by the willingness of the passenger to travel at what is usually the slower pace of the motor coach.

Division of traffic between the railway and highway is already in the process of adjustment. A re-

Part of an address presented at the annual convention of the motor bus division, American Automobile Association, Philadelphia. Mr. Scarr formerly was bus supervisor for the Pennsylvania R. R.

view of the passenger traffic handled by the railroads of the United States during recent years indicates a rapid and steady increase from 1900 to 1910. The rapid increase ended abruptly at this period, and except for one brief decline continued to advance, but slowly, to a peak in 1920. From the peak of 1920 to 1925 a sharp decline in total passengers carried has been experienced by the railroads, rather than the increase which was to be expected from increases in population and industrial development.

Accompanying the decline since 1920, however, the average journey per passenger has steadily lengthened; this, with other available facts, indicating that the long haul traffic enjoyed by the railroads is increasing. The commutation traffic has also increased steadily since 1920.

It is quite evident, therefore, that the only remaining class of traffic, the "short haul single ticket" or small group business, has declined sufficiently to account for the increase in long haul and commutation traffic as well as the sharp decline in the total passengers handled.

The private automobile which, because of its convenience and flexibility, has absorbed most of the traffic lost by the railroads, has also tremendously increased the riding habits of the people and thereby created a new and larger traffic peculiar to itself. The motor coach, advancing into the field of organized highway transportation, has drawn its traffic largely from the private automobile, and as traffic congestion and parking regulations become more severe and a more general knowledge is attained by the private automobile owner of the cost of supplying himself with this convenience, the motor coach will draw its patronage more and more from the private automobile rider.

A careful survey of railway transportation indicates that a large per centage of local steam passenger trains are not earning sufficient passenger revenues to pay the "out of pocket" costs. These trains are, therefore, generally averaging a smaller number of passengers than can be accommodated in a single 50-passenger motor coach. The through passenger business has been little affected, except in rare instances. Pending the development of commercial aviation, the steam train will probably continue to meet the long-haul requirements.

Fords Buy a Surrey

Horsedrawn carriages are not so passe as is generally believed. So observed an official of a carriage concern at Seymour, Ind., after receiving an order for a two-seated surrey of the vogue of 30 years ago from Edsel Ford, son of the man whose horseless vehicles have done much to motorize transportation. Despite the increase in number of automobiles there is a growing demand for carriages and surreys, the official said. As in the case of Ford, he said the majority of such conveyances are purchased for use near summer homes of the wealthy.

Bus Transport Is Gaining

Common carrier buses are now operating over 270,000 miles of route against 257,000 miles of rail line. Although this growth has been attained, and in a comparatively short time, says the American Automobile Association, the industry is still in its infancy.

In 1926, says the association in its bus division's publication, Bus Facts for 1927, just published, 2,395 million passengers were carried in buses, with 2,100 million of this total transported by common carriers. There are 42,040 common carrier buses and 32,800 used for the transportation of school children. The total investment in rolling stock, terminals, garages and similar assets, amounts to practically 450 million dollars. Common carrier buses took in gross revenue of practically 300 million dollars in 1926 while the motor vehicle operators paid in taxes 712 million dollars out of a total bill of about a billion dollars.

Of the 42,040 common carrier buses as of January 1, 1927, 31,500 were intrastate carriers, 2,500 interstate carriers, 7,284 operated by electric railways and subsidiaries, and 756 by steam railways and subsidiaries. The remaining 38,000 non-common-carrier buses were largely school buses —these taking 32,800 of the total.

The Famous Ormond-Daytona Beach. This Beach is 200 to 300 Feet Wide at Low Tide. Photograph by the Florida East Coast Railway.

One of the New Buses of the Southern Pacific Transport Company Just Put Into Service by That Railroad.

The others were hotel, sight-seeing and industrial buses.

Production of bus chassis in 1926 totaled 13,687, representing the output of 62 manufacturers and four operating companies. There were 10,653 bodies built by 117 body manufacturers and nine large operators in 1926. It is of outstanding importance that in 1926 the potential carrying capacity of all bodies built was larger than in the previous year, although the actual number of bodies built was smaller.

Street Cars Give Way to Buses

Street car service in Ottawa, Ill., has been discontinued in favor of bus transportation. Several other Illinois cities, including Streator and Quincy, also have made the change.

In seeking permission for the change the Illinois Traction Co. informed the city council and the state commerce commission that it could better serve Ottawa with bus transportation. After the council approved the change the commerce commission granted the order. Bus service is to be started within 60 days.

The electric company agreed to repave the streets it marred in removing its tracks, build a retaining wall along the Illinois river bluffs and pay $500 a year rental. In some sections of the residence districts the company will lay paving over the tracks. Seven bus routes will replace seven street car lines and later other bus branches will be established, the company announced.

Maintenance the First Duty

The principal problem affecting the operation of buses and trucks, after the purchase, is to keep the equipment in such condition that it will continue to produce economically the results for which it is operated, says the A. C. F. Motors Co., in a little booklet on "Maintenance."

Motor buses and trucks used in revenue service for passengers or freight are essentially transportation equipment, just as are freight cars and locomotives. They give the same sort of service and are operated for the same purposes.

The motor bus is not an automobile; the automobile is essentially a pleasure vehicle which produces no tangible profit, and on which the loss of use for a few days is not a matter of serious consequence, while the motor bus is a revenue producing vehicle. Its profit is affected by the cost of operation and by its ability to operate continuously and regularly.

The steam and electric railroads have learned by many years of experience that the problem of operating at a profit involves, among other things, the economical maintenance of equipment. The railroads maintain their own equipment (except rebuilding) as they use it from day to day, and most of this maintenance consists of proper care only; oiling, adjusting, cleaning, etc. No railroad would think of sending its equipment to the shops of the manufacturer for current repairs although such shops are situated conveniently at numerous points throughout the country; but many operators, including even some railroads, when they buy a fleet of buses or trucks, often consider them as automobiles and, forgetting their railroad experience, think of "service" like that which comes from an outside service station as an incident necessary to the operation of such equipment.

"Service," if it is to be good service (and if it is not good, then it is worse than none), means providing ample facilities and men to take care of troubles which develop in vehicles within a given territory. The problem which faces the service manager is that of determining the amount of service requirements he must be prepared to meet. If he prepares for the maximum, his service will be excellent, but it is bound to be expensive. The man who uses the

service station is the man who pays the expenses. If the service station is not properly manned, cost may be low, but service is likely to be poor and sure to be too slow. Even if a service station of the manufacturer can handle maintenance work as cheaply as the owner of the equipment, it can not do it as quickly as necessary, for the simple reason that the process involves movement and delay, and is, therefore, put off as long as possible. Maintenance work should be done when it is needed, not when it is convenient. No bus or truck ever earned a nickel for its owner awaiting its turn for attention. In the case of the automobile it is not such a serious matter; it is merely an inconvenience. In revenue producing transportation, however, the vehicles themselves are the revenue producers, and lay-ups or delays affect the earning capacity or involve the increased expense of additional "spare" equipment.

The only practical solution is a maintenance department, organized as an integral part of the transportation system, equipped and manned to handle in an orderly way all the maintenance and repairs necessary to keep the equipment moving. There is no reason, barring accidents, why a motor bus may not, if it is properly designed and built, produce revenue every day until it has run a half-million miles or more, because with such equipment the necessary maintenance work can be done during the hours when there is no traffic to handle. But to get such a result, the bus must be treated as transportation or railroad equipment, not as an automobile. It must be maintained, not serviced. It is the only possible way of operating economically in mass transportation.

Maintenance is periodic work which puts off serious trouble indefinitely. The motor bus operator who has his own maintenance department with daily inspection, lubrication, adjustment and general supervision, forestalls any serious trouble in any unit, and thus keeps his buses operating at a constant high level of efficiency and profit. Any equipment will last longer through proper maintenance.

The motor bus operator who has no maintenance department, and who must rely upon outside service, usually keeps his buses going far beyond the time when they should have attention. Depending upon service stations keeps operators from controlling one of the principal elements which contribute so vitally to their own success.

The cost of a maintenance department is not excessive or burdensome; it means merely the establishment of a definite daily routine or schedule, rigidly adhered to in every detail. The yearly saving in motor repairs and the increase in revenue from continual operating ability will in fact show substantial economies over the manufacturer's service station method. Maintenance is the operator's business; it cannot, profitably to the operator, be made the business of anybody else. The equipment and personnel necessary depends upon the character and quantity of the coaches used. It is impossible to maintain some buses with anything less than the equivalent of a factory branch, a good sized stock room, and a corps of expert mechanics. Others, built with consideration to the practical problems of maintenance, may require only the simplest facilities and a minimum of expert labor.

The time to study most phases of maintenance is at the time of the selection of a vehicle. If the vehicle selected is designed to reduce maintenance and repair work to the simplest possible operations, and if it is built of good materials and with workmanship, the result will be the lowest possible cost per mile of operation. And the lowest cost per mile is one of the most important factors in making money in a bus operation. If in selecting a bus, these questions are ignored, the result is likely to be disappointing or worse.

So far as maintenance is concerned the whole structure of mass transportation in America is built around the idea of routine upkeep and perpetual renewal which prevents major replacements because

Some Contrasts in Transportation in the Black Hills Country. Round the Summer White House in South Dakota.

Power and Large Capacity Are Built Into Every One of These International Dump Trucks.

it makes them unnecessary. If three generations of railroad equipment experience have anything to teach the users of this new piece of transportation equipment —the motor coach,—it is the simple principle of standardized, timely and economical maintenance.

Don't be too easily allured by low first cost; it is an incident only, and has no significance whatever in the final outcome of an operation. What do a few hundred dollars, or even a thousand or two, in first cost amount to when compared with a cent or two per mile increase in maintenance cost or an additional hundred thousand or two hundred thousand miles of life? But whatever vehicle you may select, it will cost less to operate under a proper maintenance program than under any outside service arrangement yet devised.

In selecting your equipment, be sure it is so designed and built that it has passenger appeal in looks, comfort and safety, that it is sufficiently sturdy to do the work intended, with a view to long life and quick efficient maintenance; be sure that the manufacturer maintains parts stations, conveniently located and stocked with ample reserve parts, and that the manufacturer can provide you with experienced maintenance men to assist you, when needed, in training your organization in necessary and sound maintenance methods. It is also essential further to investigate the history of the manufacturer in supplying heavy-duty, revenue earning equipment, and his financial resources to meet existing and future demands.

Regulation Looms for Motors

Congress in its coming session, will be called upon to enact legislation subjecting interstate motor bus and truck transportation facilities to regulations such as now govern other common carriers. The legislation will be based on recommendations of the Interstate Commerce Commission which has just completed an exhaustive investigation lasting nearly two years into the extent and the effect of the unregulated competition offered interstate rail lines by buses and trucks.

Statistics illustrate vividly not only the magnitude of the problem, but its difficulties as well. Federal and state activities in the building of extensive hard road systems encouraged the phenomenal growth of bus and truck transportation facilities until a total of 2,684,222 trucks and 80,040 buses were registered in 1926.

Estimates place the bus mileage in the United States at approximately two billion miles and the number of passengers carried in 1926 at 2,395 millions. Similarly the use of trucks has increased amazingly in recent years because of their undisputed value in so-called short hauls of 30 miles or less. It has been estimated by the federal bureau of public works that trucks carry two-thirds of their tonnage over distances of less than 30 miles.

Of the 80,040 buses in use in 1926, 34,000 were operated as independent passenger lines, 7284 by electric railways and their subsidiaries, 756 by steam railroads and their subsidiaries, 2650 by sightseeing bus lines, 2550 by miscellaneous users and 32,800 by schools for carrying pupils. An interesting sidelight found in the surveys is that 875,462 children are carried daily by the 32,800 school buses and that the cost of such transportation for the school year 1924-1925 was estimated at over thirty million dollars for 43 states.

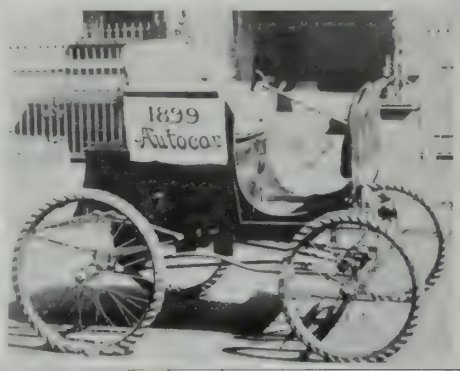
A man can sometimes find himself out under the stars, but if he wants to lose himself let him turn his energy into useful work.—Through the Meshes.

Motor cars are not hurting the interurban business, the American Electric Railway Association says. Electric railways of the United States carried 230 million more passengers in 1926 than in the year before.

"Keep ahead of the procession and you cannot grow old. Old age is not a matter of years, it is a matter of vision."—A. Edwin Keigwin.

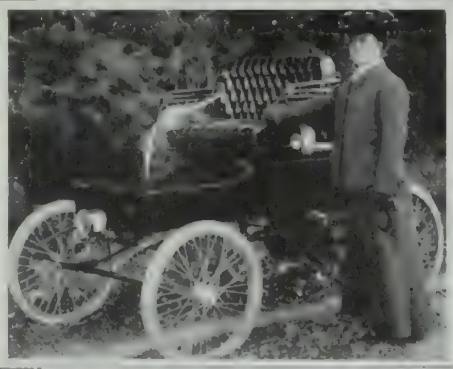
Where are the Cars of Long Ago?

At the left, one of the first motor cycles produced. Right, the puncture-proof rope tires of 1899. Can you imagine it?



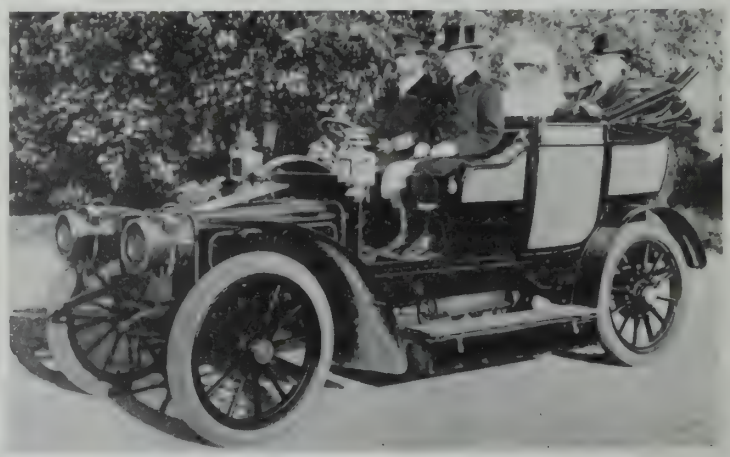
At the right we have our old friend Blanche Bates, watching out for a motor cop, as she tears along in her new Cadillac. Them was the days. By the way, some of these same old Cadillacs are still on the job

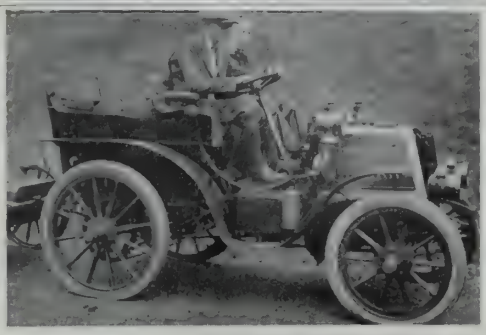
Just south of this section, ladies and gentlemen, we see R. E. Olds's model for four thin spaces, as the printer says. The 6 h.p. gas engine made 8 or 10 miles an hour at times, and created something of a furore in the frolicsome days of '91



Eighteen years ago Julia Marlowe, now Mrs. E. H. Sothern, at the left, called this rather snappy—the car, not the hat and skirt. No glaring headlights; bicycle tires. Pretty nifty outfit, we tells the world

- Internat'l Newsreel Photos.





Upper left, the gent at the wheel is none other than King Victor Emanuel, of Italy, and the queen. Upper right, Mrs. Leslie Carter and somebody in a bowler, if you takes the English term for it. At the lower left we see a Panhard of 1899, a famous car in its day. This was a flashy racing model, and it won the great Paris to Bordeaux race in 1899.

Queer Things Recorded in August

CADET Flyer Elmer P. Rose of Kelly Field, San Antonio, faced court martial, last month on charges of manslaughter because he flew his plane so low that it decapitated a galloping cavalryman in the army air maneuvers at El Paso.

The accident occurred on a mesa near Fort Bliss. Private Robert Griffin, the cavalryman, was riding across the mesa when the planes passed. Rose told his superiors the air was "bumpy" and his plane dropped suddenly. The landing gear took off Griffin's head. Rose was not aware of the accident until he landed.

Engines With Chimes

Chimes, as railroad engine equipment in the Sacramento valley, will shortly make their appearance on two Southern Pacific steel monarchs. Air chime whistles now are being installed while the engines are in the shop being reconditioned to bring them up to modern power. By the substitution, officials point out, a more effective warning is given and a great saving in the cost of operation effected. The old steam whistles are said to have required 1200 pounds of coal and four tons of water for continuous operation over an hour.

It Must Have Been a Warm Day

Crazed by the intense heat of the desert, Andrew Ulysses Jackson, a negro, held a Santa Fe freight train crew at bay for nearly an hour between Amboy and Daggett and took charge of it for himself, one day in August. The negro boarded the slow-moving freight train west of Amboy and calmly walked into the caboose, where Conductor H. L. Booth and two brakemen were sitting. Drawing a butcher knife from under his coat, the crazed negro shouted: "Prepare yourself, because your time has come!"

Fearing an attack, none of the trainmen attempted to disarm him, but distracted him by a running fire of talk. As quickly as he entered the negro left the caboose, and Conductor Booth scribbled a note which he dropped to a track walker, instructing him to wire ahead for railway officers.

The negro saw the note fly through the air and the track walker pick it up. He left the train and chased the track walker nearly half a mile before he gave up the chase, badly outdistanced.

The train was plugging along up grade and the negro caught up with it, again boarding the cars. He ran to the engine and there threatened the engineer and fireman with death unless they took him to Los Angeles.

Again the man was talked out of his threats and, laughingly exclaiming that the train belonged to him, crawled out along the boiler to the pilot, and there he sat, surveying the desert and the track ahead.

As the train rolled into Daggett, Division Special Agent Fred Smithson, Constable J. H. Lucas of Daggett and C. H. Caldwell, a railway officer, overpowered the negro after a struggle.

Stolen Car Found in Spain

"She's a regular sea-going hack, I guess," said a Chicago policeman the other day when he notified G. Marshall of that city that his automobile, stolen in Chicago, had just been found in Barcelona, Spain. The car, which disappeared in September, 1925, was traced as a result of the arrest in New York of Jacques Ballester, said to be the head of an international ring of automobile thieves. Marshall had collected theft insurance on the machine.

Long Runs in England

The latest sensational news from London says that with the beginning of the summer season in Europe, trains are making long nonstop runs. One express travels from Euston station to Glasgow and Edinburgh without a stop between England and the Scottish cities, the distance of the uninterrupted run being 236½ miles. Another special runs between King's Cross and Newcastle, a distance of 268 miles, without stopping. For some time another train has been covering the 226½ miles between Paddington and Plymouth without resting.

French Trying for Speed

French railroads are trying to reestablish their pre-war mile-a-minute schedules. France once had some of the fastest trains in the world, but the war left the roadbeds in bad condition and equipment in worse. Europe's quickest train service was claimed in the old days for the Paris-Calais train, which beat 60 miles an hour. Several long runs were made at better than 56 miles an hour.

The chap who invented interest worked on a sound principle.

Among the Men Who Do the Work

JOHN GRAY, a section hand on the Delaware & Hudson R. R. was wielding his pick near Port Kent, station, N. Y., one day, the latter part of July, when word was brought to him that a long-distance telephone call from New York City awaited him.

Hastening to the village he received the news he was heir to a fortune of $500,000. He went back to his pick and shovel and finished his day's work. Then, accompanied by his wife, he left for New York.

A Boyhood Dream Came True

Conductor Gus Lar Rieu and Charley Adams, an engineer, were assigned to the same run recently by the Southern Pacific. Forty years ago they played railroading in the backyard near where they still live in Oakland and declared that some day they should work together. The boyhood dream came true rather late in life for both are veterans. Lar Rieu has been a conductor for 21 years and Adams has had 26 years' service at the throttle. Today the men who sent the string of dry goods boxes plunging through the realm of fancy are operating one of the finest passenger trains, the San Francisco Overland Limited. Lar Rieu is conductor and Adams is engineer. As they compare watches in the scant minute before the last passenger is aboard, it doesn't require much of a stretch of imagination to take them back to the boyhood days of 40 years ago, when the neighborhood kids watched the same formality with all the mimicry of youth.

How to Own a Railroad

A young man working in a railroad office in Minneapolis determined, several years ago, to get into business for himself, the Minneapolis Star relates—and the Star, by the way, is very distinctly a labor paper. The young man had saved a little money and he began a still hunt for a business he could buy and run and be his own boss.

He knew the railroad business, but he did not know all about it. Nor did he find any railroads he could buy with a few hundred dollars down and the rest in installments. There were several small businesses he could buy but he knew nothing about any of them. Finally he went to his father's banker. What kind of business did he wish to enter, the banker asked.

"The railroad business, but I can't very well buy a railroad. The capitalists have bought them all up."

"Any objection to going into a partnership agreement?"

"Not if it's all right."

"Well, if you will pick out the railroad you like, I'll buy you a piece of it, and you will be in the railroad business just as much as if you owned the whole thing.

"Bonds. A first-mortgage bond is better than buying the railroad, because you can sell it at full value whenever you like."

"But I won't have any hand in running the railroad."

"You'll have a hand in running that little department of it that you're in charge of, won't you? That is a great deal."

"Then you think that road I am working for is a good buy?"

It happened that at the time the banker did.

And so the boy put the better part of a thousand dollars into railroad bonds.

"When you get enough of those bonds and have learned more about the railroad business you can trade them for voting stock and you'll be running your own business besides owning it," the adviser said as the boy left.

"And I have always considered that I went into business for myself right then and there and have been ever since," the young man said the other day in the athletic club.

He is not so young as he was and he has always drawn a salary from a railroad, but he owns enough railroad stocks to be quite a factor in the railroad business even without his good position.

Have you tried going into your own line of business "on your own" that way?

Free Delivery Library

In all the elevated railway trains in large cities, you may have noticed, particularly in the mornings and evenings, the guards make it their special duty to gather every newspaper and magazine found in the seats at the end of the run. This paper is delivered to the company's agents and sold in bales, amounting to very large sums of money every year.

A baggageman on the Southern Railway—Robert M. Cobb is his name—running out of Atlanta to Salisbury, N. C., has a much better plan, as described in the American Magazine recently. Cobb goes through the train, gathers the papers and magazines the passengers have thrown aside, straightens them out into readable shape, ties them in bundles, and throws them out at the points where he thinks they will be most appreciated.

People soon learned of this free delivery, gathered at the outdoor offices, and waited for the train that put them in touch with the outside world. This service, for which no one is paid, has been in active operation for twelve or thirteen years, and to continue as long as this man with a heart can manage to dodge the pension regulations.

Where Are You Headed, Young Man?

The Definite Purpose

By W. J. Harahan

President, Chesapeake & Ohio

IN THE forty years during which I have been engaged in railroad work I have seen a great deal of development in the industry. I have been an active general officer of a railroad for more than 25 years. I know intimately the change that has taken place during that period, and I can say from personal knowledge that the problems of today are far harder from a managerial standpoint than they have ever been during the period of my own knowledge of the situation.

It is true that every other business has gone through the same history—that is, in every other business the margin between profit and loss has become more limited as time has flown, so that every other business has to encounter the same general problem. This means that as transportation forms such an important part of the cost of doing business, business men demand better results, in order to keep pace with the development of their business requirements as to cheapening their costs.

One of the things that has become important to the average merchant is the avoidance of carrying large stocks of goods on hand. The merchant has learned this is an expensive proposition for him. It eats into his profits to an alarming extent. He has discovered that efficient railroad operation means he does not have to carry such large stocks of goods, and he is therefore demanding efficient transportation. All this goes to show the intricate problem the railroad manager of today has to contend with, and therefore goes to show also the necessity for a higher order of managerial talent than was required in the earlier times.

You young men will have to work out these problems, beginning within a very few years, when we older men shall have been forced to relinquish our tasks. There is no guaranty that the future will be any easier or any less intricate so far as railroad management is concerned than it has been in the past and is today. Therefore, if you desire to be railroad managers, or hold positions even of lesser importance, you must equip yourselves by hard study, by cultivating your powers of observation, and by doing any other thing essential for fitting yourselves beforehand for the problems which will confront you.

W. J. Harahan, President, Chesapeake & Ohio.

No man can come forth from nature equipped to handle the important work connected with railroad operation without having some education which will fit him for it. We are very eager to help you in every way we can. We solicit the opportunity to be of service to you. We shall watch your careers with the greatest interest. We earnestly solicit the opportunity of making whatever suggestions occur to us as being for your good, and if you will do your part there can be no question as to the final result.

One quality I wish to stress and emphasize by repeating it and giving the reasons for its necessity, even if I have mentioned it in our previous conferences: That of having some definite aim in life. For instance if a machinist's apprentice feels that perhaps there is nothing beyond him except being a machinist, if he is going to be contented always to remain in that position with the idea that if perhaps he is lucky he may become a gang foreman or some other character of foreman he is not, to my mind, setting a proper aim to which he should aspire. He should set a goal far beyond that if he desires to continue in the railroad business, and he should work to the end of reaching that goal. When he begins to attain the success which he sees is leading him toward that goal then, if there is a position higher up, he should raise his goal to the higher point. I may be pardoned if I illustrate what I have in mind by giving my own experience. My father and I were both railroad men; both became presidents of large railroads. My

Excerpts from an address to the Younger Railroad Men's Conference at Huntington, Ind.

earliest thought was of railroading. I never had any desire to consider any other profession. My father was so thoroughly in love with his work that by his example my mind early became impregnated with the thought that there was no work to be compared in any respect with railroading. My first work on a railroad after school was as a machinist's apprentice. At that time my father was superintendent. It seemed to me at that time that if I ever could reach that important position I should have reached the summit. As time went on, however, and as I approached the position of division superintendent, I set my goal higher and higher, until I reached the highest position in the gift of a railroad.

My father had exactly the same experience. This is purely personal, yet it is an illustration of what I have in mind when I say that unless a man does have some definite goal he will simply drift along aimlessly like a ship without a rudder, until he finds himself listed with the vast majority of medium or lower accomplishment. Sometimes through lack of this important qualification the most brilliant men drift about until they reach that undesirable port whose only name can be Failure. I hope it will be your strenuous effort to avoid such an undesirable fate.

Some of you are in the mechanical department, some in the operating department, some in the traffic, accounting or some of our other departments. There are many positions in all of them well worthy of your most earnest effort. Master mechanic is a very important position and one in which your efforts can have great beneficial effect upon the operations of the railroad. It is a stepping stone to other important positions in that department and in the operating department. You can reach it with proper effort. Division engineer is a position open to all, and is also a step to higher positions. There are important positions in the traffic department which can be reached by the clerks and others in that department. The accounting department has many important positions which can be reached with the proper kind of effort. Division superintendent, one of the most stirring and important positions on the whole railroad, is within the reach of those setting about it and prosecuting their work in the right way.

Every young man in this audience should realize these things are true, and should make as his goal the appropriate position to which he can aspire, and should not be afraid to set the goal too high.

Cooperation has become so common a topic for us of the Chesapeake & Ohio to discuss that I do not deem it essential to dwell upon it at length here, except to say that we continue to feel proud of the effort our men are making to cooperate with us, and we still see greater and greater results accruing from the carrying out of the policies attending cooperation. There is one feature of cooperation, however, which I desire to emphasize and again direct to your notice. In the first place, in order to bring about cooperation, it is necessary to lay down one first principle—that is the belief on the part of everybody on the Chesapeake & Ohio that we have the best men, operating the best railroad in the world; that we are trying with all our power to be fair to one another and to be fair to the public, and if we do that it means being fair to everybody interested, that is, the public, our men and our stockholders. It means that when we subscribe to that principle we are bound to produce efficient operation because every man's sole thought is to accomplish that. We know this is the result of that kind of effort because we have experienced it during the last few years and are experiencing it today. Many items of our operation are the best in the country, and that result has been largely produced by cooperation. We acknowledge with grateful thanks the part our men have played in bringing about that result.

There is one thing, however, that is absolutely essential, and without which we cannot hope to attain any great degree of success in our efforts, and that is we must always be in position to keep our property in such condition that it will mean the ability to operate it with the greatest efficiency. We cannot expect a workman to turn out good work unless we provide good tools. This is true whether it be a good hammer, a good saw, a good typewriter, good offices and good shops, with proper ventilation and the other accessories for good work; a good locomotive or a good car. Those of us who have been on the Chesapeake & Ohio for a number of years know the difference between the kind of work that can be accomplished with good tools versus the kind of work accomplished with inefficient tools. We cannot possibly provide these good tools unless we are allowed to have the proper rates necessary to enable us to pay remunerative wages to good men who will thus be induced to enter and remain in our service, and which will, after payment of all necessary expenses, leave enough margin so that we may have a credit which will enable us either to borrow the money or take it from our income for the purpose of supplying these efficient tools.

The longest continuous stretch of concrete roadway in the world has just been completed between White Bear and Duluth, Minn. This pavement passes through 29 towns and villages over its 137-mile length. This Minnesota pavement is two miles longer than the concrete pavement extending from Olympia to Vancouver, Wash. The third longest length of concrete rural pavement reaches from Kansas City to a point west of Columbia, Mo., 125 miles.

Canada has one automobile to every eleven inhabitants; India, one to every 3893 people.

Help Your Road and Help Yourself

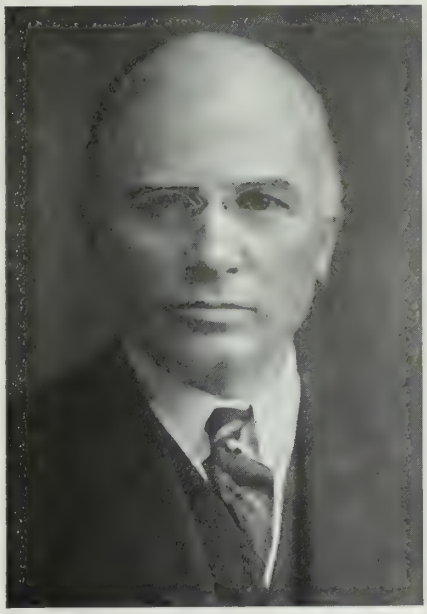
A Talk for Employes

By Daniel Willard

DURING the eighteen years which have elapsed since I became president of the company, the Baltimore & Ohio has spent upon its property for enlargements, improvements and extensions over $400,000,000 of new capital. It seems probable that it will be necessary to continue such expenditures for an indefinite period if we are to keep the property in position to render prompt, efficient and adequate service.

There are only three ways in which a railroad can obtain money for improvements. One way, and that usually is very limited, is to apply surplus earnings to that purpose, provided there are any surplus earnings left after paying expenses of every character, taxes, interest on funded debt and a reasonable dividend to the owners or holders of the capital stock. For several years we have been able to apply toward improvements a rather substantial amount from current earnings. This has been helpful not only in adding necessary facilities but in strengthening the company's credit, but the necessity to so apply the income has prevented the shareholders from receiving as large a return upon their investment as they ought fairly to receive in prosperous periods. In any event, that method is limited, and the major portion of our improvements must be paid for from new capital raised in some other way.

A railroad is very much like any other business. In fact, the principles which underlie railway management do not differ greatly from the principles which we apply or should apply in connection with our own domestic affairs. The railroad may be likened to a house which anyone may own. If the house happens to be clear of debt, usually it is possible to raise a certain amount of money by placing a mortgage upon it, but the size of the mortgage is very definitely limited with relation to the value of the house; so it is with railroads.



Daniel Willard, President, B. & O. R. R.

The Employe's Duty

IT IS to the joint interest of all of us that we should do all we properly may do to promote the success of the Baltimore & Ohio. Of course, we ought to do that in any event as long as we are connected with the company, because when we accept employment in any capacity, whether as president or track laborer, and I have been both, it is our moral duty to give good, efficient and loyal labor for what we receive.

—President Willard.

You may be surprised to know that all the new money the Baltimore & Ohio has raised or secured for the extension of the property during the last 18 years has been obtained by placing additional mortgages upon the property, with the exception of such amount as came from surplus earnings. You all know you cannot continue to increase the mortgage on any piece of property indefinitely; so it is with the railroad. The time was approaching when it would not be desirable or practicable for the Baltimore & Ohio to further enlarge the mortgage upon its property. Therefore, we have recently arranged, as you probably have noticed, to sell $63,000,000 additional capital stock. While we are not required by law or contract to pay dividends on stock in the same way that we are required to pay interest on a mortgage, nevertheless those who buy our stock have a moral right, which should be just as carefully observed as if it were a legal right, to expect a fair return upon their investment. Whether we shall be able at all times to pay such return or not will depend first upon the volume of business we secure, and very largely upon the economy and efficiency of our operations. What I mean more specifically is this: If, in order to earn a thousand or a million dollars, we have to spend a thousand or a million dollars, as the case may be, then there is no profit from the transaction. If, however, we find that we can earn a thousand dollars by spending only 700, then the profit is substantial, and under such conditions we can properly maintain the property, pay our operating expenses, taxes, interest, and a reasonable dividend to our shareholders, and at the same time have some surplus left for enlarging the property and as a basis for further credit.

I think you will all agree that in

Excerpts from an address before the Newark Division Veterans' Assn. at Newark, Ohio, July 28, in celebration of the Baltimore & Ohio Centenary.

any business, certainly in the railroad business, the employes of a company cannot expect to have the best possible and most satisfactory working conditions, with good wages and steady work, unless the company itself is prosperous at the same time. This brings me to the real point of all I have been saying. It is to the joint interests of all of us that we should do all that we properly may do to promote the success of the Baltimore & Ohio. Of course, we ought to do that in any event as long as we are connected with the company, because when we accept employment in any capacity, whether as president or track laborer, and I have been both, it certainly is our moral duty to give good, efficient and loyal labor for what we receive. But, as I have already said, it also is actually best for the selfish interests of every one of us to do what we can to make the company successful, because by so doing we are promoting our own personal interests.

Now, what can the employes of the Baltimore & Ohio do in order best to promote its interests? First of all we should always keep in mind that the railroad is a semi-public agency organized to perform a semi-public service. There never was a time within my knowledge when competition between railroads was as keen as it is today. But the competition of today is of quite a different character from that of 20 or more years ago. In the past, competition was reflected largely in the rate structure. One company would, perhaps, reduce its rates below another, and in that way seek to obtain a larger share of the business. Today, generally speaking, the rates of all companies between common points are the same, and may not be reduced without permission from public authorities, so that competition has now become largely a matter of service.

The roads in their effort to secure a larger volume of traffic can expect to do so only by giving a service that will be satisfactory to their shippers and users, and if possible somewhat better than the service given by their competitors.

The word "service" which is short and easy to speak, means and includes a great deal. Service means everything and relates to everything that has to do with our relations with the public. It means first of all courteous and agreeable contact with the public, or more specifically with that particular individual who wishes to buy a ticket or make a shipment of freight over our line. In the past it has been said frequently of railroad employes that they did not act as if they were really anxious for people to ship or travel over their line, that they performed their work in what seemed to be an indifferent manner. I am confident this is not generally the case today on the Baltimore & Ohio. I have no doubt individual instances do occur, perhaps every day somewhere on the Baltimore & Ohio line, where the particular employe who comes in contact with the public is not so courteous, not so sympathetic and helpful as he should be, as it is his duty to be, but I repeat I have reason to feel certain that in the great majority of cases Baltimore & Ohio employes are trying to live up to the standard I have indicated. But after we have made our first contact with a prospective customer, we have still devolving upon us the duty of giving the passenger a safe, comfortable and agreeable ride, taking him to his destination on time. We also have the task of seeing that freight shipped over our line is moved safely and without damage to its destination within the time we advertise for such service, and delivered promptly in good condition where the consignees can receive it conveniently and take it away. In the performance of this duty every employe of the railroad plays a more or less important part.

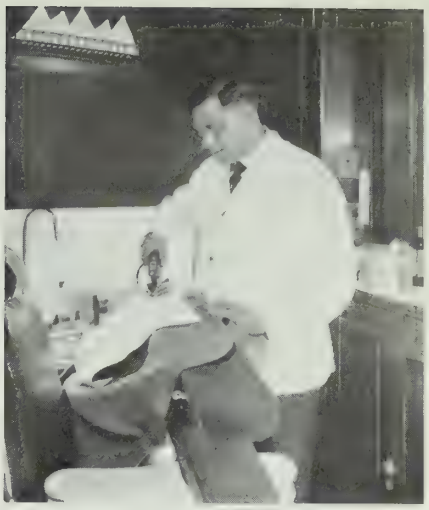
Unless the tracks are kept safe and smooth it is not possible to operate trains smoothly, comfortably and on time. Unless those who have to do with the maintenance of the cars and locomotives do their work efficiently, intelligently and honestly, we may expect failures; cars or engines will break down, bearings will run hot, boilers will leak, engines will fail for steam, and to the extent that any or all of these things happen, to the same extent the character of the service and our reputation will suffer. Then, after the trackmen have provided a safe and smooth track for the trains to run upon, and the shop forces have seen to it that the cars and engines are in fit condition for the service to be performed, it still remains for the men in charge of the trains to so operate these that they will be moved safely and expeditiously over the several districts, in order that the passengers may have a steady and comfortable ride, and the shipper of freight receive his freight in a satisfactory condition.

Of course, all employes of the company should always be glad to speak well of it, to commend its service and to recommend the use of its facilities when in their judgment the Baltimore & Ohio service will meet the requirements of the particular case. While I have emphasized the duty of every employe to commend our service and to try in every proper way to influence people to use our road, I mean, of course, that this should be done only when we are sure our service is such as to meet the shipper's or passenger's requirements. Business secured by misrepresentation is a liability. It is still true that honesty is the best policy.

If we were asked to name the greatest dividend producer year in, year out, we would unhesitatingly place good nature at the head of the list. Good-natured people get things done, and it is only deeds accomplished that ever pay. Even though we must never forget that the foundation laid by intelligent thought gets the machinery going, it is good nature that keeps it oiled.—The Ruler.

All the Comforts Of a Home On the Cars

By Whitelaw Mann



The Tailor Works While You Sleep, or Maybe You Have Two Suits.

TALK to the average untraveled man about railroad journeys covering weeks during which the passengers see many of the outstanding wonders of this very wonderful country, and the chances are that he will not believe one-half the tale. But this is because the man may not have moved about much in the last eight or ten years, or he may have a branch line vision. Perhaps he hasn't been anywhere, or maybe his travels have been confined to Europe, in which case he needs education about the marvels of his own land yet to be seen.

For many of the most striking improvements in railroad equipment, the modern comforts now available to railroad travelers, credit must go to the men who manufacture the elements of which railroads are made, sometimes called supply men but more properly referred to as commercial ambassadors. These are the representatives of the hopeful souls who conceive great improvements, invent things that make life pleasant-

The Women Have to Use Their Own Brushes and Combs While Traveling, Anyway.

er for all of us, and then face the task of selling their products to the big boys who aren't always the easiest persons in the world to convince.

Some Men Just Must Exercise, Even on an Excursion. Especially the Old Boys.

Standing by, ready to adopt the plans of these energetic producers of comfort, are great organizations like the Raymond-Whitcomb Co., and there aren't very many, and to these large credit is due because in their search for business they not only enrich themselves but also they serve a marvelous educational purpose. Money and effort they put into great undertakings such as the now famous land cruises over the nation's railroad systems, journeys a month in length, not only presenting opportunities for the people to see their own vast country in comfort, but instill in the people's minds a liking for travel, all of which is important in these days of the dwindling net return for stockholders.

It was the late Herbert Quick, a glorious dreamer in his day, who declared that no tie binds the people together so firmly as the railroad tie, and the importance of this can not be over-stated in the interest of love of country.

What a marvelous land it is this great organization, and the railroads themselves, offer for the traveler to see! The great Southwest, the Grand Canyon, California, Yosemite, the Pacific Northwest, Alaska, the Canadian Rockies, our own Rocky Mountains, the Yellowstone, Colorado, the National Parks! To see one-quarter of such a fairyland twenty years ago was enough to dismay almost anyone. It meant changing cars, but seldom your clothes, layovers, delays, irritations.

But not today. Not only do we have the finest and fastest trains crossing the continent regularly on the principal lines; not only do we have comforts on these trains undreamed of a generation ago, the most perfect trains anywhere in the world, but we have, too, the land cruise liners, as the Raymond-Whitcomb people call

This Recreation Car for Excursion Cruises Was Built by the Pullman Car & Mfg. Corpn., for the Raymond-Whitcomb Co. Lecture Hall, Gymnasium, Barber Shop and, Take Our Word for It, A Real Shower Bath.

them, trains of nine or ten special cars, some of which the Pullman Car & Mfg. Corpn., built for the company's exclusive use. Think of an entertainment car! In this are the gymnasium, with apparatus like that of an ocean liner's gymnasium; the big recreation room for dancing and lectures, 50 persons can be comfortably seated; the library-lounge; the barber shop, with adjoining shower bath, equipment for moving pictures, a radio, Orthophonic Victrolas! Another type of car provides rooms with bath attached. Some of these rooms have beds instead of berths, wardrobes, dressing tables, shoe locker, extra chairs. Of course there are porters everywhere, a hostess whose duties are to assist women traveling alone; maid, valet, gymnasium and library-attendant, barber, hairdresser. Every conceivable item of the kind now found only on the most famous American trains! But in addition, there are luxuries, conveniences and services, that even a millionaire traveler with his private car or special train can not expect.

Because of commercial necessity the ordinary trains repeatedly traverse sections of magnificent scenic areas at night. The average traveler has a vague idea there are a good many wonders along the way that he has missed; still, he has had no choice. The specially arranged journeys are so scheduled that this is overcome, and nothing of great interest is omitted. The transcontinental railroads too, are doing

This is a Four-Hand Game, But the Dummy Has Just Stepped Out.

everything possible to overcome this feature by making special side trips for their patrons, detours by motor to little visited regions heretofore seldom seen.

Mark Twain said travel is fatal to prejudice, a wise remark, and in the same vein the philosopher Thomas Fuller declared, "Know most of the rooms of thy native country before thou goest over the threshold thereof." Which we moderns have changed to the pert, "See America First."

One of the Handsome Observation Cars on the Northern Pacific's North Coast Limited.

Coal For the Railroads

Some idea of the extent to which railroad operation affects other industries is given by the fact that in 1926 the roads spent $473,353,928 for fuel alone. Of this amount $375,981,414 was for approximately 140,000,000 tons of bituminous, or soft coal.

This in turn represented about one-fourth of the bituminous coal production of the country. In fact, the railroads constitute the largest group of soft coal consumers.

The production of coal used by railroads provided work for about 150,000 men working in mines in 30 states. These men have an average daily output of about 4½ tons each, the highest in the w It is said the British miner, ranks next to the American miner in efficiency, has an average daily output per man of only about one-fourth as much.

Chile has appropriated more than $1,000,000 for extension and improvement of its railway.

Afganistan, with a population estimated at about 6,000,000, has only 500 motor vehicles.

Washing the Linen of Millions

Railroad Laundry Work

By W. J. Howard

THERE'S a lot of dirty linen in the railroad business. And this doesn't refer to politics or labor agreements; it means linen, and the other fabrics that go through their brief careers under that much abused name.

Thirteen million pieces were washed, inspected, and in many instances repaired or renewed, last year, in the Union Pacific's big laundry at Ogden. From 75 to 110 persons, an average the year 'round of about 80, earn a living handling this mountain of soiled table equipment from the company's dining cars, parlor, club and business cars, and the numerous hotels, restaurants and lodges. During the season of heavy travel in the summer two shifts are busy day and night at this work.

Railroads, of course, impose no cover charge in their eating places —and they serve meals well within the price limits of any good restaurant, and much cheaper than the big hotels—but they have a real excuse for doing it. Practically every patron gets a clean tablecloth; for some are careless and sloppy, and trains do occasionally get a jerk or a jolt about the time the guest is trying to find his mouth with a spoonful of soup or a cup of coffee. Then there are coats and aprons for the waiters and the kitchen crew, and napkins and towels by the hundredweight. In the hotels there are still larger tablecloths, b e d s p r e a ds—how many guests ever turn back a spread before tumbling into bed? —and more towels, including those that go up to the room and out in the travelers' grips. Men who wouldn't dare mistreat a towel in their own homes apparently think it perfectly proper to shine their shoes with them in a hotel or cut them to pieces with razor blades. For doing such a thing at home they'd be scalped alive, and they know it.

Corner in the Mending Room.

The laundry at Ogden is a sight

Issue Room in the Union Pacific's Big Laundry At Ogden Where Dining Car and Hotel Linen Is Washed.

In the Sorting Room of the Laundry. Here All Articles Needing Repairs or Special Treatment to Remove Stains Are Segregated.

worth seeing. Being admirably situated, geographically, it serves the four units of the Union Pacific System, the parent road, the L. A. & S. L., the Oregon Short Line, and the O. W. R. R. & N., and, of course, makes direct exchanges of clean for soiled articles with the cars passing through Ogden. This plant contains modern laundry machinery, extractors or wringers, drying appliances, mangles, steam press ironers and other ironing apparatus, not overlooking, either, the best safety devices providing automatic control stops. In addition to all this is the large department for the seamstress force handling the articles to be repaired or replaced with new pieces made there. All machinery, including that for marking, is electrically operated.

Then, harking back to the careless or thoughtless guest, there are the many pieces of linen upon which various knotty business problems have been elaborately worked out with indelible pencils. Some men would find themselves dumb and helpless without a pencil. These marks and the many stains of the fruit season have to be removed, and special treatment is required. Throughout the laundry the work is scientifically handled, neutral soaps, the best of washing soda, and no injurious acids.

Employes have a well equipped rest room, and individual steel lockers for all in separate quarters.

Sao Paulo, Brazil, is considering the addition of 50 motor omnibuses to coordinate with its municipal trolley service.

Orange Free State, South Africa, has an automobile boom.

When Sleeping Cars Were A Novelty

The first attempt to provide the railway passenger a place to sleep while on his journey was made on the Cumberland Valley R. R. of Pennsylvania between Harrisburg and Chambersburg. In the winter season the east bound passengers arrived at Chambersburg late at night by stage coach, and as they were exhausted by a fatiguing trip over the mountains and many wished to continue their trip to Harrisburg to catch the morning train for Philadelphia, it became very desirable to provide sleeping accommodations aboard the cars. The officers of this road fitted up a passenger car with a number of berths, and put it into service as a sleeping car in the winter of 1836-37. It was exceedingly crude and primitive in construction. It was divided by transverse partitions into four sections, and each contained three berths, a lower, middle, and upper berth. This car was used until 1848 and then abandoned.

About this time there were also experiments made in fitting up cars with berths something like those in a steamboat cabin, but these crude attempts did not prove attractive to travelers. No bedclothes were provided, and only a coarse mattress and pillow were, and with the poor ventilation and the rattling and jolting of the car not much comfort was afforded, except a means of resting in a position somewhat more endurable than a sitting posture.

Previous to 1858 a few of the leading railways had put on sleeping cars which made some pretensions to meet a growing want of the traveling public, but they were still crude, uncomfortable, and unsatisfactory in their arrangements and appointments.

In 1858 George M. Pullman entered a train of the Lake Shore R. R. at Buffalo to go to Chicago. It happened that a new sleeping car which had been built for the rail-

road company was attached to this train and was making its first trip. Mr. Pullman stepped in to take a look at it, and finally decided to test this new form of luxury by passing the night in one of its berths. He was tossed about in a manner not very conducive to the "folding of the hands to sleep," and he turned out before daylight and took refuge upon a seat in the end of the car. He now began to ponder upon the subject, and before the journey ended he had conceived the notion that, in a country of magnificent distances like this, a great boon could be offered to travelers by the construction of cars easily convertible into comfortable and convenient day or night coaches, and supplied with such appointments as would give the occupants practically the same comforts as were afforded by the steamboats.

Pullman began experiments in this direction soon after his arrival in Chicago, and in 1859 altered some day cars on the Chicago & Alton, and converted them into sleeping cars which were a marked step in advance of similar cars previously constructed. They were successful in meeting the wants of passengers at that time, but Pullman did not consider them in any other light than experiments. One night, after they had made a few trips on the line between Chicago and St. Louis, a tall, angular looking man entered one of the cars while Mr. Pullman was aboard, and after asking a great many intelligent questions about the inventions, finally said he would try what the thing was like, and stowed himself away in an upper berth. This proved to be Abraham Lincoln.

The Pullman Co. now introduced the hotel car, which was practically a sleeping car with kitchen and pantries in one end, and portable tables which could be placed between the seats of each section and upon which meals could be conveniently served. The first hotel car was named the "President," and was put into service on the Great Western R. R. of Canada in 1867. Soon after, several popular lines were equipped with this new addition to the luxuries of travel.

The Big Washing Machines in the Union Pacific Laundry At Ogden.

After this came the dinner car, which was still another step beyond the hotel car. It was a complete restaurant, having a large kitchen and pantries in one end, with the main body of the car fitted up as a commodious dining room, in which all the passengers in the train could enter and take their meals comfortably. The first dining car was named the "Delmonico," and began running on the Chicago & Alton in 1868.

The comforts and conveniences of travel by rail on the main lines now seemed to have reached their culmination in America.

In 1886 Mr. Pullman went practically to work to devise a perfect system for constructing continuous trains, and at the same time to provide for sufficient flexibility in connecting the passageways to allow for the motion consequent upon the rounding of curves. His efforts resulted in what is now known as the vestibuled train.—"American Railways in 1887."

Tools

I love the tools made for mechanics. I stop at the windows of hardware stores. If I could only find an excuse to buy more of them than I have already bought on the mere pretense that I might have use for them! They are so beautiful, so simple and plain and straight to their meaning. There is no "Art" about them, they have not been **made** beautiful; they **are** beautiful.—Robert Henri.

Unproductive Locomotive Costs

By O. O. Carr

Cost to run a locomotive and caboose to balance power should be considered in studies of comparisons, etc., covering different phases of train operation where costs are involved, particularly on trains that may be run in direction of heavy traffic loaded with less than the established maximum locomotive tonnage rating. This move indirectly creates a proportional, additional expense by influencing in part the necessity for running a locomotive and caboose in opposite direction to balance power, and a portion of this expense is properly chargeable to the lightly loaded train run in direction of heavy traffic.

From a viewpoint of strictly "balancing power," the expense to run a locomotive and caboose, direction of light traffic, is an arbitrary one, but because of this, when making cost studies, it should never be assumed that it does not cost anything to run a train in the direction of light traffic. There would be no additional cost for fire up coal and water, enginehouse men and enginehouse supplies, and but little, if any, additional wages of the crew. There would be an additional expense, according to number of cars and tons given such train for increased running consumption of fuel and water, locomotive and car repairs, and switching of the train, etc.

These selected costs to run a train in the direction of light traffic would be the difference between the costs to run only a locomotive and caboose, and that of a locomotive and caboose with a train, or the costs over the arbitrary.

The table herein illustrates estimates of these selected cost items to run the locomotive and caboose, double heading locomotive on average of six-car passenger train, and running locomotive light with conductor as pilot.

A locomotive without a train, or one handling a very light train, does not require the attention and repair of engines handling large trains and worked to the maximum to make time. There is less slipping, saving wear on tires, and less general loosening up of engine rods and knuckle pins. They also lubricate better on account of the limited amount of steam required to do the work. A locomotive given a heavy train, making fairly good speed, develops high temperature of superheat, which makes lubrication more difficult, and in turn makes heavy wear on valves and cylinder packing, greater wear on rod brasses and knuckle pins because the engine cannot be worked at as short a cut off. Brake shoe wear also is more as it takes longer braking space to stop a heavy train.

The table probably will not be clear to many average persons unfamiliar with decimals carried out to the fourth and fifth generation. For the benefit of such, if there are any, it should be said that the totals of the three columns may be plainly stated as 70-44-44.

Rudolph Diesel Award Conferred

W. F. Joachim, mechanical engineer, Langley Memorial Aeronautical Laboratory, has been selected to receive the Rudolph Diesel Award for 1927, consisting of a suitable certificate and a cash prize of $100, for his paper entitled "Oil Spray Investigations of the National Advisory Committee for Aeronautics," presented at the Oil Power Week meeting, April 21-23, 1927, at Pennsylvania State College. The committee of award consisted of F. Thilenius, division superintendent, Prairie Pipe Line Co., F. G. Hechler, professor of engineering research, Pennsylvania State College, and R. Miller, ass't chief engineer, oil engine department., Ingersoll-Rand Co.

Recklessness is no indication of courage. Brave men are always cautious. Therefore, cultivate the habit of being careful.

Minimize friction and create harmony. You can get friction for nothing, but harmony costs courtesy and self-control.

Estimated selected cost items of unproductive locomotive operations—Speed 35 m.p.h., level track, and under favorable operating conditions.

	Cost per Mile		
	Average frt. loco. and caboose to balance power	Average passgr. loco. double headed on 6 car pasgr. train	Average passgr. loco. light with condtr. pilot
Wages	$0.3047	(a)$0.1072	(b)$0.1688
Fuel (incldg. fire up and stand by loss)	(c).156	(d) .114	(e) .10
Water	.0051	.0039	.0037
Lubricants for loco.	.0015	.0026	.0015
Lubricants for caboose	.00006	....	....
Other supplies loco.	.0047	.00351	.0034
Eng-housemen	.0459	.04276	.04276
Eng-house supplies	.0139	.01283	.01283
Running repair loco.	.0567	.078	.0551
Shop repair loco.	.0567	.078	.0551
Other train supplies	.0343	....	....
(f) Swtch. caboose on road engine	.01		
(g) Running reprs. to caboose	.00314		
(h) Heavy reprs. to caboose	.00837		
	.70107	.4428	.44319

(a) Engine crew only.
(b) Engine crew and pilot.
(c) Fire up and stand by loss prorated 120 mi. frt. train dist. Coal $3 a ton including transpn. of load and return empty, also chute handling costs.
(d) Running consumption charged with resistance of three cars, fire up coal prorated 250 mi. passgr. dist. Coal $3 per ton including transpn. of load and return empty, also chute handling costs.
(e) Fire up coal prorated 250 mi. passgr. train dist. coal $3 per ton, same as above.
(f) Ten minutes selected cost items swtch. engine operation prorated 120 mi. frt. trn. dist.
(g) & (h) Same as repairs to average system car owned (all classes) per car mile.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

MORE bituminous coal has been transported by water so far this year to upper lake ports than in any corresponding period, according to the car service division of the A. R. A. From January 1 to July 24, this year, 18,026 573 tons of bituminous coal were dumped into vessels at Lake Erie ports for shipment to upper lake ports. This exceeded, by 3,393,489 tons, the best previous record for that period established in 1923, and also exceeded, by 4,343,034 tons, the amount dumped during the corresponding period last year. Bituminous coal on hand and ready for dumping into vessels at Lake Erie ports on July 24 totaled approximately 793,700 tons compared with 767,250 tons on the same period last year.

Safety Council Meeting

The sixteenth annual congress of the National Safety Council, will be held in Chicago September 26-30. At the meetings of the steam railroad section addresses will be made by L. C. Fritch, vice president of the Rock Island; R. C. White, assistant general manager of the Missouri Pacific; H. Johnson, president of the Duluth & Iron Range; L. A. Downs, president of the Illinois Central; L. F. Lorenz, director of the bureau of statistics of the Interstate Commerce Commission; and G. G. Dowdell, chief surgeon of the Illinois Central.

Loading of Revenue Freight

According to the records of the car service division of the A. R. A. the loading of revenue freight up to August 13 of this year totaled 32,335,621 cars compared with 32,400,962 for the same period last year and 31,390,575 in 1925.

Railroad Earnings in 1927

Class I railroads for the first six months this year, had a net railway operating income of $472,611,052 which was at the annual rate of return of 4.58 per cent on their property investment, according to reports just filed by the carriers with the bureau of railway economics. In the first half of 1926 their net railway operating income was $495,598,414 or 4.93 per cent on their property investment. Property investment is the value of road and equipment as shown by the books of the railways, including materials, supplies and cash. The net railway operating income is what is left after the payment of operating expenses, taxes and equipment rentals but before interest and other fixed charges are paid. This compilation as to earnings for the first half of 1927 is based on reports from 183 Class I railroads representing a total mileage of 238 269 miles. Gross operating revenues for the first six months in 1927 totaled $3,022,381,698, compared with $3,035,101,220 for the same period last year, or a decrease of four-tenths of one per cent. Operating expenses for the first half of the year amounted to $2,308,888,990 compared with $2,304,453 383 for the same months one year ago or an increase of two-tenths of one per cent. The Class I roads in the first six months of 1927 paid $185,158,597 in taxes, compared with $183,632,277 for the same period the year before. For June alone the tax bill of these roads amounted to $32,580,351, a decrease of $622,925 under June the previous year. Twenty-seven Class I railroads operated at a loss in the first half of 1927 of which 12 were in the eastern, four in the southern and 11 in the western district. Net railway operating income by districts for the first six months with the percentage of return based on property investment on an annual basis as follows:

		Pct.
New England reg.	$ 19,191,677	5.05
Great Lakes reg.	89,348,978	5.08
Central eastern reg.	112,569,152	5.26
Pocahontas reg.	40,717,324	8.51
Total eastern dist.	261,827,131	5.50
Total southern dist.	69,031,887	4.63
Northwestern reg.	32,852,244	2.59
Central western reg.	73,218,881	3.82
Southwestern reg.	35,680,909	4.02
Total western dist.	141,752,034	3.48
United States	472,611,052	4.58

In view of the fact that the railway business and earnings fluctuate from year to year, only the showing of results over a period of years can indicate the real trend of railway returns. The rate of return on property investment for the five years ending with June, 1927, has averaged 4.55 per cent.

Class I railroads in June had a net operating income of $87,363 547, which for that month was at the annual rate of return of 4.35 per cent on their property investment. In June, last year, their net railway operating income was $107,393,656 or 5.48 per cent. Gross operating revenues for June amounted to $517,028,880, compared with $541,447.283 in June, last year, a decrease of 4.5 per cent. Operating expenses in June totaled $388,024,845 compared with $391,419,366 in the same month in 1926, a decrease of nine-tenths of one per cent.

New York Road to be Scrapped

Supreme Court Justice Thomas H. Noonan has issued an order authorizing Frederick W. Kruse, Olean, former judge of the appellate division and receiver for the Olean, Bradford & Salamanca Ry., Olean, N. Y., to discontinue operation of the interurban line between Bradford, Pa., and Salamanca, N. Y., and scrap the properties. There was practically no opposition to the application which was made some time ago by the receiver. The road is about 85 miles long.

Y. M. C. A. Memorial to Grice

A memorial to E. W. Grice, formerly assistant to the president of the Chesapeake & Ohio, who died last year was dedicated at Blue Ridge, N. C., on July 30. Mr. Grice was always an ardent supporter of the Railroad Y. M. C. A. The memorial was a testimonial to him because of his interest in the C & O Railroad Y. M. C. A. The structure consists of five columns of native stone surmounted by an octagonal concrete roof in which is mounted a large locomotive bell to be used to call class sessions at the Blue Ridge Y. M. C. A. summer conference. In the center of the structure is a clear spring of cool mountain water.

Petition to Acquire Oregon Line

The Union Railroad of Oregon has applied to the Interstate Commerce Commission for authority to purchase and operate a line 2.1 miles in length extending from Union Junction to Union, Oregon. The application stated that the road is now operated at a loss by the Central Railroad of Oregon. The applicant advised the commission that it is not and will not be connected with any other road.

Rail Rates on Fruit Reduced

A reduction of 13 cents a 100 pounds on California fresh fruit, other than oranges, lemons and apples, moving to the eastern half of the United States, was ordered by the I. C. C., effective October 10. By the same decision, the commission ordered the California fruit rates to Denver and Rocky Mountain territory generally reduced at the same

time by 12 cents. Complaints of the California producing interests against the present rates were sustained almost completely by the commission. Present rates are $1.73 a 100 pounds from California to the eastern half of the United States and the commission ordered a new rate of $1.60. Present rates to Denver and the Rocky Mountain territory are $1.62 a 100 pounds and the commission ordered a figure of $1.50. At the same time the carload minimum weight on grape shipments was increased from 26,000 pounds to 30,000 pounds.

When prices are low, transportation charges become an important item of expense in production and marketing of fruit. That is the present condition of the industry, and in the producers' view the market must be brought nearer by means of rate reduction. As a further point, the commission said congress by special resolution had directed it to utilize its power over rates for the purpose of assisting agriculture affected by depressions. By the testimony of economists, bankers and growers and by comprehensive statistical data it has been established that the deciduous fruit industry in California for the last five years has been undergoing a period of deflation and depression.

Judge Rules Taxes Too High

Federal Judge Faris on Aug. 17 approved the sale of the United Railways, St. Louis, to the reorganization committee, rejecting the city's objections, and gave the municipality four months to elect whether it will settle the mill tax judgment of $2,396,321 on the basis of one-third cash or the alternative offer of two-thirds preferred stock of the company. The court allowed the city interest only to the date of the receivership in 1919, or $35,545, making the total claim $2,431,867. Judge Faris held the offer to the city was fair when compared with the settlement made with stockholders of the old company. He figures preferred stockholders get $21.75 on each $100 of their claim and common stockholders only 75 cents compared to the offer of $33.33 cash or twice that in stock offered the city. In discussing the financial difficulties of the company the judge said its troubles were due largely to over-taxation, citing that no other corporation or individual in Missouri has such a tax burden. He stated any suggestion of a return to the 5-cent fare is not even respectable nonsense, pointing out that while fares have advanced from 5 to 7½ and 8 cents the expenditures for wages, equipment and materials by the company in the same period advanced 81 per cent.

New Officers of Chicago Heights Terminal

Effective August 1 the following became officers of the Chicago Heights Terminal Transfer R. R.; President, T. C. Powell; vice president and general manager, F. G. Nicholson; comptroller, F. R. Austin; treasurer, J. P. Reeves; secretary, G. A. Burget; general agent, P. S. Lottinville. Headquarters for all will be at Chicago except Mr. Lottinville who will be placed at Chicago Heights. The I. C. C. recently authorized the Chicago & Eastern Illinois Ry. Co. to acquire control of this road by purchasing its entire capital stock, subject to a series of eight conditions. These require the maintenance of the corporate entity of the terminal company and its present neutrality of handling traffic, etc., and provide that the I. C. C. retains the right to reopen the proceedings on the application of anyone having an interest at any future time.

Electrification of St. Paul Extended to Seattle

With the opening of a ten-mile extension to the western terminal of the Chicago, Milwaukee & St. Paul, Seattle is now a terminal of the longest electrified railroad in the world. In recognition of this event, the mayor of Seattle, Mrs. Bertha K. Landes, piloted the 260-ton electric locomotive hauling the first train into Seattle from Black River Junction, where it formerly had been necessary to change to a steam-driven locomotive. All trains, including the two through passenger trains, the Olympian and Columbian, as well as the Ranier Park Special between Seattle and Tacoma, are now drawn by electric locomotives into either Tacoma or Seattle. This extension brings the total electrification of the St. Paul road to 655 miles. This extends from Harlowton, Mont., to Avery, Idaho, a distance of 440 miles, and from Othello, Wash., to Seattle and Tacoma, a distance of 215 miles.

Chicago Surface Line Starts Bus Feeder

The Chicago Surface Lines on Aug. 11 started their first bus line in coordination with street car service. The new line extends along Diversey Parkway from Laramie Avenue east to Crawford Avenue where connection is made with the Diversey car line. The 7-cent fare charged on the buses includes transfer privileges to street cars operating to all parts of the city. The application of the Chicago Surface Lines for a bus certificate has been before the Illinois commerce commission for more than a year, but an order was issued only a short time ago. Objections to such a grant have been filed from time to time by the Chicago Motor Coach Co. and the final order is now being appealed by that company.

Central California Traction Sale Approved

Permission to purchase the Central California Traction Co. has been granted the Southern Pacific by the Interstate Commerce Commission on condition that the Southern Pacific immediately resell equal shares in the control to the Western Pacific and Santa Fe railroads. Complete control of the traction company, the commission held, by a single trunk line railroad would result in disadvantage to shippers in the Sacramento section.

By a contract presented to the commission the Southern Pacific proposed to take over the traction company for $750,000 in cash and $2,200,000 in bonds. The Santa Fe also offered to buy the road while the Western Pacific, which intervened, declared its willingness to take it over as well, all of the trunk lines being actuated by a desire to control the eastern haul on the very extensive grape and produce traffic originated by the traction company.

"In view of all the circumstances, we are of opinion that the continued impartial operation of the traction property can best be assured by a joinder of the three trunk lines in the control of the traction corporation," said the commission decision, "and that control of the carrier by two of the trunk lines would afford the next best alternative."

Site for Union Station at New Orleans

Three sites for a union station in New Orleans, have been picked by G. E. Smith & Co., of St. Louis, consulting engineers, engaged by the Louisiana public service commission to make a study of the passenger station needs of that city. The report presented by the engineers recommends a site on the Old Basin canal, west of Basin street, between St. Louis and Orleans streets, if it is decided that only one station should be built. If the plan for two union stations is adopted the report recommends the construction of one on the Old Basin canal for the Louisville & Nashville and the Southern, and a second station one block west of the existing station at Howard avenue and South Rampart street for the Illinois Central, the Texas & Pacific, the Missouri Pacific, the Southern Pacific, the New Orleans, Texas & Mexico and the Louisiana Railway & Navigation Co.

Airplane Service between Detroit and Florida

Regular weekly airplane passenger service between Jacksonville, Fla., and Detroit, Mich., with a stop in Atlanta, will begin November 1, by the Dixie & Northern Air Line, according to an announcement issued by William C. Wakefield, of Detroit, president of the line. Planes will leave Detroit and Jacksonville once a week at 8 o'clock in the morning and make the flight in nine and one-half hours. The service will be maintained until May 1. If the traffic warrants, the schedule of flights will be increased, the announcement states. A tri-motored Ford-Stout plane is to be used in the service.

Report on Grade Crossing Accidents

Reports filed by the railroads with the Interstate Commerce Commission show that 668 persons were killed in grade crossing accidents in the first four months of 1927. This is a decrease of three compared with the total fatalities for the same period in 1926. Two thousand persons were injured in grade crossing accidents in the four months period this year compared with 2,062 in the first four months last year. Reports showed 1,746 highway grade crossing accidents occurred from January 1 until May 1, this year, compared with 1,761 for the same period last year or a decrease of 15 accidents. In view of the fact that more than 22 million automobiles are now in use and the number constantly increasing, the hazard from such accidents is increasing.

Daily Movement of Freight Cars Increases

The average daily movement per freight car for the first six months of 1927 was the highest for any corresponding period on record, amounting to 29.9 miles a day, according to bureau of railway economics. This was an increase of nine-tenths of one mile over the same period last year, and an increase of three miles over the same period in 1925. The daily average for June was 30 miles, a decrease of one-tenth of a mile under June last year but an increase of 2.5 miles over June 1925. In computing the average daily movement, account is taken of all freight cars in service, including cars in transit, cars in process of being loaded and unloaded, cars undergoing or awaiting repairs and also cars on side tracks for which no load is immediately available. The average car load for the six months this year was 27.3 tons, an increase of four-tenths of a ton above the average for the first half of 1926 and an increase of one-half a ton above that for 1925. The average car load for June, this year, was 27 tons compared with 27.3 tons in June, last year, and 26.9 tons in June, 1925.

Cab Curtains for Locomotives

The Interstate Commerce Commission has assigned for further hearing at Detroit on September 7 and Albany on September 14 the complaint filed by the railroad commission of Wisconsin asking the commission to require railroads to equip their locomotives and tenders in Wisconsin and other states subject to similar climatic conditions with cab curtains or other devices to protect employes from inclement weather. In a hearing at Madison an agreement was reached that carriers using locomotives in the territory south of the southerly line of Virginia, Kentucky, Missouri, Kansas, Colorado, Utah, Nevada and a line running southwesterly from Carson City to San Francisco may be considered as not being involved in the case. Further hearings are to be held at a point in South Dakota and a point in Montana.

Loan Fund for Engineering Students

The Galveston Electric Co., Galveston, through R. G. Carroll, manager, has announced that Stone & Webster will establish a $10,000 student loan fund for the benefit of engineering students at the Texas College of Agriculture and Mechanics.

Greatest Freight Traffic In History

Class I railroads in the first six months in 1927 handled the greatest freight traffic on record, according to reports filed by the carriers with the bureau of railway economics. The freight handled in the first half of the year amounted to 233,794,568,000 net ton miles, an increase of 6,821,980,000 net ton miles or three per cent over the corresponding period last year, which marked the previous high record. The railroads in the eastern district reported an increase of 3.5 per cent compared with the same period in 1926 while those in the southern district reported a decrease of nine-tenths of one per cent. The roads in the western district reported an increase of 3.9 per cent. While freight traffic for the first half of the year broke all previous records, reports for June showed a volume of freight amounting to 38.483 389,000 net tons miles which was a decrease of 768,756,000 or two per cent under June of last year, when the heaviest freight traffic for any June on record was reported. All districts reported a decrease for June compared with the same month in 1926, the eastern district showing a decrease of 2.7 per cent, the southern 3. 6 per cent and the western, two-tenths of one per cent.

Santa Fe Valuation Ruling

Rejecting a claim of the railroad for a figure of $750,000,000 the I. C. C. on August 8 fixed a final valuation for rate making purposes of $579,057,598 upon the Santa Fe as of June, 1916. The commission's tentative valuation of $566,296,084 was protested by the Santa Fe which contended for the $750,000,000 figure, but in the new finding practically all of the road's claims for an increase were rejected. On the valuation date the Santa Fe had outstanding capital issues of $634.924,553, while its book investment account, representing the corporation's value of its railroad system was $534,221,828.

Explaining its findings, the commission said the total represented "an organized, developed, well-maintained and seasoned property in successful operation as a going concern." Though the Santa Fe had in cash in its treasury on the valuation date $42,553,671, the commission held that a cash balance of $15,665,500 would be an adequate sum for working capital and included only this total in the property valuation allowed.

Springfield Company Increases Bus Service

The Springfield Street Ry., Springfield, Mass., has discontinued railway service on the Palmer-Worcester line and established an hourly bus service, connections for Worcester being made at Southbridge. This stretch of about 40 miles is the longest yet to be converted from trolley to bus service by the Springfield and the Worcester Consolidated, which are under one control.

Pacific Coast Surgeons Meet

Chief Police Surgeon Goodrich of the Los Angeles Receiving Hospital was elected president of the Pacific Association of Railway Surgeons at the twenty-fifth annual convention held recently in Los Angeles.

Others officers chosen were: Dr. R. L. Ramey of the Southern Pacific lines, first vice-president; and Dr. Philip Stephens, chief surgeon of the Union Pacific lines, second vice-president. Drs. C. A. Walker and W. T. Cummins were re-elected as treasurer and secretary, respectively. It was decided to hold the next convention in San Francisco.

Frisco Trains on Time

Of the 5,689 passenger trains operated by the Frisco Lines in July, 5,498, or 96.6 per cent were operated on time, the records of the Frisco's operating

department show. This is an improvement as compared with June and July of last year. The central division, which extends southwest from Monett, Mo., to Paris, Tex., has first place with a performance of 99.2 per cent; the western division, which extends southwest from Beaumont Junction, Kans., to Vernon, Tex., and west from West Tulsa, to Avard, Okla., was second with 99.1 per cent, and the River division, which extends south from St. Louis to Turrell, Ark., and southwest to Hunter, Mo., was third with 97.5 per cent.

Railway Construction

Tracks and Yards

ARKANSAS.—The St. Louis Southwestern has awarded a contract to Bunnell & Mack, Paragould, for embankments along a waterway at a number of points between St. Francis and Campbell.

CANADA.—The Canadian National has awarded the following contracts: to Stewart & Cameron, Winnipeg, for clearing the right of way, grading and the installation of culverts on the Sturgis-Peesane branch from a point near Mile 21 to Crooked River, Sask. This contract is in addition to the contract already awarded for the portion of the line between Sturgis and Mile 21; to H. G. Macdonald & Co., Edmonton, for clearing the right of way, grading and culverts on the Willowbrook (Sask.) North Westerly branch, 22 miles; to Tomlinson Construction Co., Ltd., Winnipeg, for clearing the right of way in connection with the revision of the line at Mile 162.1 on the Brazeau, Alta., subdivision; to the Western Construction Co., North Battleford, for clearing, grading and culverts on the extension of the Turtleford, Sask., southeast branch from the present end of the grade at Rabbit Lake to a junction with the Blaine subdivision, between Denholm, Sask., and Shellbrook, near Spears, 37 miles.

—The Canadian Pacific has awarded the following contracts: to Duff, Flint & Co., Regina, for the substructure of a 76-ft. through plate girder bridge on the Keewatin subdivision of the Manitoba district to Stewart & Cameron, Winnipeg, for the extension of the Lanigan-Melfort branch from Melfort, Sash., north 10 miles; to Riley & Reed, Edmonton, for grading and culverts on the proposed branch from Maxstone, Sask., west and southwest 10 miles.

COLORADO.—The Denver & Rio Grande Western has awarded a contract to Arthur & Allen, Pueblo, for grading in connection with two industrial spurs at Loma, totaling three miles of line.

IDAHO.—The Oregon Short Line has awarded a contract to the Utah Construction Co., Ogden, for grading in connection with the construction of 12 miles of second main track and more than a mile of side track between Minidoka and Dietrich. The construction of culverts, laying of track and fencing will be done by company men. The estimated cost of the whole project is about $1,149,000.

ILLINOIS.—The Mobile & Ohio has awarded a contract to John Marsch, Inc., Chicago, for reduction of grade and rearrangement of line between Columbia and Waterloo, which involves moving about 250 000 cu. yds., of earth.

IOWA.—See item about the Burlington under Missouri.

MISSOURI.—An application has been filed with the I. C. C. by citizens of Missouri and Iowa for a certificate of public convenience and necessity requiring the Burlington to connect its branch line between Sedan, Ia., and Elmer, Mo., with its main line from Kansas City and St. Joseph to St. Louis and Chicago, by an extension of the branch to its main line near Macon.

NEBRASKA.—The Union Pacific has awarded a contract to C. T. Whelan, North Platte, for grading in connection with a three-mile extension of the Lyman branch and a three-mile extension southeasterly from Sears, the station at the end of the Lyman branch. Track work will be done by company men.

NEW JERSEY—The public utility commission of New Jersey has given the Pennsylvania, with the United New Jersey Railroad and Canal Co., permission to construct a siding track at grade across Fourth street.

—The Pennsylvania has awarded a contract to the James McGraw Co., Philadelphia for filling and track laying for additional tracks in the yard at Greenville, to cost $150 000.

NEW YORK.—The New York Central has awarded a contract to the Railway Engineering & Construction Co., Boston for culverts in connection with double tracking at Falls Road, Eagle Harbor, Middleport and Lockport. Arthur McMullen & Co., New York, has been awarded a contract for the laying of electric ducts in connection with improvements along the company's west side line in New York.

PENNSYLVANIA.—The Lehigh & New England has awarded a contract to F. H. Clement & Co., Bethlehem, for grading and track laying in connection with a new hump classification yard and locomotive terminal to cost approximately $450,000, which will be known as Tadmor terminal, between Bath and Nazareth. The yard will consist of ten receiving tracks, with a capacity of 260 cars, and twelve classification and storage tracks, with a capacity of 624 cars.

TEXAS.—The Panhandle & Santa Fe has awarded a contract to the Sharp & Fellows Contracting Co., Los Angeles, for a line from Whitedeer, northwest 11 miles. The remaining 10 miles of the 21 miles of line recently authorized by the I. C. C. will be constructed in the future.

—The San Antonio & Aransas Pass has awarded a contract to the W. J. Harris Contracting Co., Houston, for an extension between Harlingen and Brownsville, about 30 miles.

—The attorney general's department of Texas has approved the application of the Gulf & West Texas for a line from San Angelo to San Antonio, with a leased line connection from San Antonio to Corpus Christi. The proposed line would be constructed through Tom Green, Schleyer, Sutton, Kimble, Kerr, Kendall, Gillespie, Mason, Runnels, McCullagh, Concho, Menard and Bexar counties.

UTAH.—The Ogden Union Railway & Depot Co., has awarded a contract to the Utah Construction Co., Ogden, for grading and laying of 11,500 ft. of track around the Ogden yard and two 80-ft. double track through plate girder spans over the Weber River on concrete piers and abutments. The estimated cost of the project is about $180,000.

VIRGINIA.—The Richmond, Fredericksburg & Potomac has awarded a contract to W. W. Boxley & Co., for grading in connection with the change of alignment at Powell's Creek near Cherry Hill. The estimated cost of the grading is $200,000.

WEST VIRGINIA.—The Virginian Railway has awarded a contract to Haley, Chisholm & Morris, Charlottesville, for second main track work and for the concrete lining of a tunnel in Wyoming county, estimated to cost $100 000.

WYOMING.—The Union Pacific has applied to the I. C. C. for authority to build an extension of approximately 54 miles from a connection with its pres-

ent line at or near Creighton, southerly to a point on its line in the vicinity of Egbert, Burns or Hillsdale.

Buildings and Structures

ALABAMA.—Aliceville. The St. Louis-San Francisco has awarded a contract to the S. G. Kershaw Contracting Co., Birmingham, for a number of frame combined passenger and freight stations on the line now under construction between Aliceville and Aberdeen, to cost $25,000.

—Mobile. The Alabama, Tennessee & Northern has awarded a contract to the Atlantic Bridge Co., Greensboro, for piers and steel work for an all-steel bridge.

ARIZONA.—Adamana. The Santa Fe has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 300-ton reinforced concrete three-track conveyor type coaling station.

ARKANSAS.—Ashdown. The Graysonia, Nashville & Ashdown will build a brick combined freight and passenger station, to replace a structure destroyed by fire. This company also plans to reconstruct a number of bridges, raising the track above flood stage in the Red River.

—Gurdon. The Missouri Pacific has received bids for a 400-ton reinforced concrete, mechanically operated coaling station.

—Jonesboro. The St. Louis Southwestern has awarded a contract to Bunnell & Mack, Paragould, for a timber highway viaduct.

CANADA.—Drumheller, Alta. The Canadian National is said to be planning coaling stations of 100-tons' capacity at Drumheller and Oyen.

—Wetaskiwin, Alta. The Canadian Pacific has awarded a contract to J. H. Simmons, Winnipeg, for a four-stall enginehouse, a sand house and a cinder pit.

—Cheakamus, B. C.—The Pacific Great Eastern has awarded a contract to Stewart & Barber, Vancouver, for the substructure of a bridge over Cheakamus Canyon, to cost about $25,000.

—Kaslo, B. C. The Canadian Pacific has awarded a contract to C. McDougall & Son, Victoria, for a brick and concrete enginehouse.

—Prince Rupert, B. C. The Canadian National is said to be planning a 2000-ton ice house.

—Squamish. The Pacific Great Eastern has awarded a contract to Dawson, Wade & Co., Vancouver, for a concrete arch bridge and substructures for bridges at three points near Squamish.

COLORADO.—Brush. The Burlington has awarded a contract to the Brush Lumber Co., for a one-story brick and stucco combined passenger and freight station, to cost about $25,000.

—Denver. The Burlington will bear two-thirds of the cost of a reinforced concrete and steel highway subway under its tracks, at 44th and Washington streets. The structure will cost about $35,000.

—Limon. The Rock Island has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 150-ton two-track timber coaling station.

DELAWARE.—Wilmington. The Pennsylvania has awarded a contract to the U. G. I. Contracting Co., Philadelphia for an addition to the passenger car shops, to cost about $200,000

ILLINOIS.—Arlington Heights. The Chicago & North Western has awarded on contract to S. G. Cool, Chicago, for a reinforced concrete foot subway with four sidewalk openings under its tracks.

—Chicago. The Chicago & Western Indiana has awarded contracts to the Ellington Miller Co., Chicago, for a freight transfer station and a brick office and equipment building, to cost $40,000.

—The Pennsylvania has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for a bridge.

—DeKalb. The Chicago & North Western has awarded a contract to the Ogle Construction Co., Chicago, for a 150-ton, four-track, reinforced concrete electrically operated coaling plant to replace a frame trestle and coal chute recently destroyed by fire.

—Lawrenceville. The Baltimore & Ohio has awarded a contract to the Vang Construction Co., Cumberland, for a pier to cost $35,000.

—Martinsville. Bids closed August 31 for the sub-structure of a bridge to be built by the Pennsylvania. The project involves the placing of about 2,000 cu. yd. of reinforced concrete and is estimated to cost $60,000.

—South Chicago. The Baltimore & Ohio has awarded a contract to the Ellington Miller Co., Chicago, for a brick passenger station, estimated to cost $50,000.

IOWA.—Estherville. The Rock Island has awarded a contract to Joseph E. Nelson & Sons, Chicago, for a mechanical cinder conveying unit.

INDIANA.—South Anderson. The Big Four has awarded a contract to the Ellington Miller Co., Chicago, for a reinforced concrete and brick enginehouse, and a number of minor service buildings, to cost about $200,000.

KANSAS.—Emporia. The Santa Fe has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 1,000-ton reinforced concrete four-track electric conveyor type coaling station with scales, and a 1,500-cubic yard reinforced concrete air hoist sanding plant with automatic gravity steam drying system.

—Phillipsburg. The Rock Island has awarded a contract to Joseph E. Nelson & Sons, Chicago, for a mechanical cinder conveying unit.

LOUISIANA.—Gouldsboro. The Texas & Pacific has awarded a contract to H. F. Hinrichs & Son, New Orleans, for a two-story office building at the engine terminal and yard.

MAINE.—Presque Isle. The Bangor & Aroostook has awarded a contract to the Phoenix Bridge Co., Phoenixville, covering the strengthening of a bridge, increasing the loading from Cooper's E 30 to E 60. The estimated cost is $40,000.

MINNESOTA.—Invergrove. The Rock Island has awarded a contract to Joseph E. Nelson & Sons, Chicago, for a mechanical cinder conveying unit.

MISSISSIPPI.—Aberdeen. See item about St. Louis-San Francisco under Aliceville, Alabama.

MISSOURI.—St. Louis. The Missouri Pacific has awarded a contract to M. P. Heil, St. Louis, for a one-story foundry and tin shop at the shops at Ewing avenue.

—Springfield. A contract has been awarded to the Pioneer Construction Co., Kansas City, for a highway subway under the tracks of the St. Louis-San Francisco at National avenue. The cost of the project, which is estimated to be $44,000, will be partly borne by the railroad.

NEBRASKA.—Minatare. The Burlington is said to be planning a brick and stucco combined passenger and freight station, to cost about $25,000.

—Nevins. The Union Pacific is said to have prepared plans for the renewal of a pile trestle bridge over the North Platte River east of Nevins. An 88-span pile bridge and an earth fill equal in length to 40 spans will replace the original 128-span pile bridge.

—Omaha. The Missouri Pacific has awarded a contract to the Folwell-Ahlskog Co., Chicago, for a 500,000 bu. addition to a grain elevator, to cost about $500,000.

NEW JERSEY.—Camden. The Pennsylvania has awarded a contract to the Ogle Construction Co., Chicago, for a 750-ton, four-track, electrically operated, reinforced concrete coaling station and sand handling plant.

—Glen Ridge. The Erie has awarded a contract to the O'Gara Construction Co., Newark, for a bridge.

—Newark. The Lehigh Valley has awarded a contract to the Gahagan Co., Brooklyn, for dredging and filling work in connection with the new Lehigh Valley-Pennsylvania bridge over Newark Bay. This company is said to have prepared plans for a transfer platform at its yards in Newark.

—**Paterson.** The Lackawanna has awarded a contract to F. D. Hyde, New York, for a new passenger station, to cost about $100,000.

—**Roselle Park.** The Lehigh Valley is said to be planning a bridge.

NEW YORK.—Elmira. The Lackawanna is receiving bids for a three-story Y. M. C. A. building, to cost about $75,000.

—**Hornell.** The Erie has awarded a contract to the Hecker-Moon Co., Cleveland, for a 7-stall extension to the enginehouse.

—**Jamestown.** The Erie has awarded a contract to the Bates & Rogers Construction Co., Chicago, to eliminate a grade crossing at Buffalo street.

—**New York.** The New York Central has awarded a contract to James Stewart & Co., Inc., New York, for two public roadways and two public passageways through the new office building to be erected at Park avenue & 45th street. A contract has been awarded to the M. F. Kelly Building Corpn., New York, for the demolition and removal of buildings and structures between West 59th and West 60th streets and grading to subgrade for tracks and driveways.

—The Pennsylvania has announced that piers Nos. 27, 28 and 29, North River, heretofore utilized for the handling of miscellaneous freight, are being extensively altered, improved and enlarged to adapt them exclusively to the handling of fruits, vegetables and dairy products for the metropolis, and provide the best possible facilities for this traffic.

—**Port Morris.** The New York Central has awarded a contract to the Frederick Snare Corpn., New York, for an additional intake for the power station.

—**Rye.** The New Haven has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for a bridge. This company has authorized the construction of a freight house and freight handling facilities, to cost about $120,000.

—**Valley Stream.** The New York public service commission has ordered the Long Island to build a passenger station at Du Bois avenue.

—**Yonkers.** The New York Central has awarded a contract to the Edward J. Duffy Co., Inc., Weehawken, for masonry excavation and concrete structural work for providing supports for a turbine generator in the power house.

NORTH CAROLINA.—Shelby. The Southern Railway is said to have prepared plans for remodeling its passenger station.

—**Spencer.** The Southern Railway is said to be planning a bridge to connect Spencer and East Spencer.

OHIO.—Akron. A contract has been awarded to the Bates & Rogers Construction Co., Chicago, for a subway under the tracks of the Pennsylvania, the Baltimore & Ohio and the Erie, at Forge street, to cost $85,000.

—**Chillicothe.** The Chesapeake & Hocking, the Baltimore & Ohio and the state of Ohio contemplate the elimination of a grade crossing south of Chillicothe, at an approximate cost of $70,000.

—**Cincinnati.** The Chesapeake & Ohio has awarded a contract to the Boxley Brothers Co., Orange, Va., for grade crossing elimination in connection with the new bridge over the Ohio River between Covington and Cincinnati.

—**Cleveland.** The Pennsylvania has awarded a contract to the Monton Scobel Co., Cleveland, for a freight house, to cost about $150,000.

Garfield Heights. The state of Ohio is asking for bids to eliminate a grade crossing on the Pennsylvania, the Wheeling & Lake Erie and the Northern Ohio Power & Light Co., to cost about $750 000. The state will bear 50 per cent of the cost.

—**Martin's Ferry.** The state of Ohio has asked for bids for a grade crossing elimination structure on the line of the Wheeling & Lake Erie, the Pennsylvania and the Wheeling Traction Co., to cost about $132,000. The state will bear 50 per cent of the cost.

—**Napoleon.** The Detroit, Toledo & Ironton has awarded a contract to the M. E. White Co., Chicago, for a reinforced concrete and steel bridge over the Maumee River, south of Napoleon.

—**Newton Falls.** The Baltimore & Ohio has awarded a contract to Milo P. Hanke, Cincinnati, for water treating plants at Newton Falls and Nova, to cost about $20,000.

—**Rootstown.** The Pennsylvania has awarded a contract to the T. J. Foley Construction Co., Pittsburgh, for grade elimination work, to cost $100,000.

—**Willard.** The Baltimore & Ohio has awarded a contract to the Vang Construction Co., Cumberland, for two water treating plants at Willard, and one at Attica Junction, to cost about $39,000.

OREGON.—Marshfield. Bids closed August 24, for a brick and tile passenger station, planned by the Southern Pacific, to cost $20,000.

—**The Dalles.** The Oregon-Washington Railroad & Navigation Co. has awarded a contract to J. E. Moore for a mill building for a plant for boring, adzing, incising and stamping new ties, estimated to cost about $11,000. A contract for the machinery has been awarded to Greenlee Brothers & Co., Rockford, estimated to cost about $70,000.

PENNSYLVANIA.—Bath. The Lehigh & New England has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 200-ton concrete coaling station, ash pit and ash handling machinery, in connection with a new hump classification yard and locomotive terminal, which will be known as Tadmor terminal. Other facilities to be constructed are an enginehouse, with boiler room, air compressor, motor and substation equipment; a one-story frame office building; a sand handling and storage plant; a brick and concrete oil house; a track scale, as well as water supply facilities, air and power lines and lighting.

Edgeworth. The Pennsylvania has awarded a contract to the Pittsburgh-Des Moines Steel Co., Pittsburgh, for a pumping station, estimated to cost $61,000.

—**Idlewood.** The Pennsylvania has awarded a contract to the Strobel Construction Co., Chicago, for the steel superstructure of a bridge.

—**Lancaster.** The Pennsylvania has awarded a contract to D. S. Warfel, Lancaster, for a new passenger station, estimated to cost $300,000.

—**Philadelphia.** The Pennsylvania has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for a bridge.

—**Sellersville.** The Reading is said to be planning a bridge.

—**Shermansville.** The Bessemer & Lake Erie has awarded a contract to the Milliron Construction Co., DuBois, for a reinforced concrete overhead highway bridge, to cost $118,564.

—**Solomon's Gap.** The Central of New Jersey has awarded a contract to Richardson Hand for concrete abutments, wing walls and a reinforced concrete deck for a highway bridge, estimated to cost $26,245.

—**Thornburg.** The Pennsylvania has awarded a contract to the T. J. Foley Construction Co., Pittsburgh, for grade elimination work, to cost $50,000.

SOUTH CAROLINA.—Greenville. The Southern Railway is said to be preparing plans for a freight terminal.

TENNESSEE.—Chattanooga. The Nashville, Chattanooga has awarded a contract to E. A. Wood & Co., Andrews, N. C., for a reinforced concrete highway crossing over its tracks west of Chattanooga, to cost about $42.200.

—**Memphis.** A contract has been awarded to the H. J. Gilbertson Construction Co., Memphis, for the Aulon viaduct over the tracks of the Illinois Central, the Louisville & Nashville, the Nashville, Chattanooga & St. Louis and the Union Railway of Memphis. The cost of the structure, estimated to be about $300,000, will be borne by the city of Memphis and each of the four railroads. The viaduct will be 2,300 ft. long and 36 ft. wide.

—Yale. The St. Louis-San Francisco has awarded a contract to the St. Louis Structural Steel Co., East St. Louis, for the superstructures of the machine shop, power shop, power house, wheel shop and washroom and locker room, to cost about $64,000. The general contracts have been awarded to J. H. Reddick, Fort Smith.

TEXAS.—Amarillo. The city of Amarillo is said to have prepared plans for a viaduct over the tracks of the Rock Island at West Eighth street, and subways under the tracks at Fillmore or Buchanan street and at West Third or West Fourth street.

—Belton. The Gulf, Colorado & Santa Fe has awarded a contract to the Ware Co., El Paso, for a one-story reinforced concrete, brick and stucco passenger station.

—Harlingen. The Southern Pacific has awarded a contract to the Ware Co., El Paso, for a two-story brick, hollow tile and stucco passenger station.

—Houston. The Missouri-Kansas-Texas has awarded a contract to T. H. Johnson, Sedalia, for a freight station to cost about $250,000. A contract for the trackage facilities will be awarded later.

—Panhandle. The Panhandle & Santa Fe, it is said, will soon receive bids for a brick and concrete combined freight and passenger station.

—Trinity. The International Great Northern has awarded a contract to the Roberts & Schaefer Co., Chicago, for an automatic electric coaling station, designed to handle lignite coal.

WYOMING.—Archer. The Union Pacific and the state of Wyoming will jointly bear the expense of an overhead highway crossing to be constructed near Archer, in connection with the relocation of the Lincoln Highway. Company men will handle the erection of steel, and the foundation and substructure will be constructed by the state.

—Red Buttes. The state of Wyoming will construct the substructure and the Union Pacific will use its own men to erect the steel superstructure of an overhead crossing near Red Buttes.

—Sheridan. The Burlington has awarded a contract to J. E. Colwell, Denver, for a storage and oil house, to cost about $35,000.

Locomotive Orders

Reports made to the department of commerce by the principal locomotive manufacturing plants show they shipped during July 59 locomotives as compared with 132 for July, 1926. The departments figures for the first seven months of 1927 show a total of 629 engines shipped, 520 of which were steam and 109 electric. The figures for the first seven months of 1926 were total 1,033; steam 899; electric 134.

During August there has been some slight improvement over July due to a few inquiries that developed, although practically no orders of consequence were placed. The Boston & Maine ordered 10 eight-wheel switchers from Baldwin, the Erie bought a couple of oil-electric engines, the Peruvian government ordered two Mikado locomotives from Baldwin, and one of the same type from American. The Missouri Pacific is reported to be figuring on five Santa Fe engines, and the Belt Railway of Chicago on the same number of switchers. Reports also seem to be current to the effect that the South African Railways are getting prices on a large number of Mallet locomotives to be built in this country. The New York Central is negotiating for some electric locomotives, and there are several other inquiries for steam lovomotives brewing.

The car service division of the A. R. A. reports the Class I railroads had 8,535 locomotives in need of repair on August 1. This is 14 per cent of the number on line, and is a decrease of 705 compared with the number in need of repair on July 15, at which time there were 9,240 or 15.1 per cent. On August 1 7.8 per cent were in need of classified repairs, and 6.2 per cent of running repairs. Serviceable locomotives in storage on that date totaled 6,663 compared with 6,463 on July 15.

Passenger Cars Orders

Orders reported for passenger cars during August were considerably smaller than during the earlier months of the year. The largest orders were those of the Erie for 25 all-steel coaches for suburban service placed with the Pressed Steel Car Co., and the New York Central's order to the American Car & Fdry. Co. for rebuilding 50 coaches. The Pullman Car. & Mfg. Corpn. received the following orders: Chesapeake & Ohio, three 70-foot steel mail and express; Chicago Great Western, two mail and baggage; Lehigh Valley, four diners and two club-diners.

The following orders have been placed recently for electric cars: Boston Elevated Ry., ten cars for use in South Boston, from the Laconia Car Co.; Kansas City, Leavenworth & Western Ry., Kansas City. Kan., four combination passenger, baggage and lounge cars, from American Car Co., St. Louis; Department of Street Railways of the City of Detroit, 125 front-entrance, center exit cars from Cummings Car & Coach Co. The Lehigh & New England R. R. has ordered a gas-electric car from the J. G. Brill Co., and the Chicago, Milwaukee, & St. Paul has ordered ten gas-electric cars with the Electro-Motive Co.'s design of power plant. Five of the cars are to be built by Pullman and five by Standard Steel Car Co.

Recent inquiries reported are: Reading, ten baggage and mail; Southern Pacific, six baggage and mail; Alabama Power Co., two interurban; Pittsburgh Railways, fifteen light-weight interurban; Richmond, Ashland Ry., Richmond, Va., two interurban; Chicago & North Western, nine gas-electric.

Freight Car Orders

According to the car service division of the A. R. A. the Class I railroads installed 45,143 freight cars in service during the first seven months of 1927. This was a decrease of 21,115 compared with the number placed in service during the same period of 1926. Of the total number placed in service this year, 7,102 were installed in July, 3,691 were box cars, 2,597 coal cars and 441 refrigerator cars. The railroads, on August 1 had 19,344 freight cars on order compared with 39,102 on the same date in 1926.

A report issued by A. R. A. shows that Class I roads had only 245,291 surplus freight cars in good repair and available for immediate service on August 15. This was a decrease of 54,657 cars compared with July 14, at which time there were 299,948. Surplus coal cars on August 15 totaled 66,130, a decrease of 896 within approximately a week while surplus box cars totaled 140,289, a decrease of 7,115 for the same period. Reports also showed 19,343 surplus stock cars, a decrease of 350 below the number reported on August 8 while surplus refrigerator cars totaled 13,036, a decrease of 641 for the same period.

We find only a very few scattered orders placed for new freight train equipment during August the total of these probably not running much above 1000 cars. The Empire Gasoline Co. ordered 100 tank cars from American Car & Foundry and the Illinois Traction System 200 drop bottom gondola and 50 drop bottom gondola bodies from the same builder, who also received an order from the Anglo-Chilean Consolidated Nitrate Corpn. for 140 cars.

The North American Car Corpn., Chicago, is said to have ordered 500 special refrigerator cars for the Pressed Steel Car Co. Several roads have been reported in the market for equipment to be used in building cars in their own shops including the Great Northern and the Northern Pacific.

Bus & Truck Orders

A statement from the department of commerce, based on reports received from 118 manufacturers in the United States, shows that in July, 29,981 trucks and buses were produced (factory sales). This compares with 37,388 for July, 1926, and brings the total for the first seven months this year up to 278,574, a gain over the same period last year of 5,727.

Orders and deliveries recently reported of buses include the following: American Car & Foundry Motors Co., two city and one parlor type from Southern Pacific Transport Co., one from Houston Electric Co., one from Illinois Power & Light Corpn., Decatur, Ill., one from Pacific Northwest Traction Co., one from Capital Traction Co., Washington, D. C., 20 from Public Service Transportation Co.; International Motor Co., seven from County Transportation Co., four from Syracuse Ry. Coordinated Bus Lines, six from Leavenworth Transportation Co., 20 from Capital District Transportation Co., Albany, N. Y., one from Holyoke Street Ry.; White Co., three from Spokane, Portland & Seattle, 10 from Public Service Transportation Co., two from St. Louis Bus Co., five from Virginia Electric & Power Co., Richmond, Va., Yellow Truck & Coach Co., 20 from Public Service Transportation Co. The Studebaker Corporation reports having received orders during the past few days for 12 buses.

Changes in Personnel

Executive & Operating

Frank I. Snyder, general manager of the Bessemer & Lake Erie at Pittsburgh, has been elected vice president and will assume the duties of that office in addition to his present duties as general manager.

J. W. Smith, general manager of the Indiana Harbor Belt, has resigned to become assistant to the president of the Boston & Maine, with headquarters at Boston.

C. Boettcher, president of the Denver National Bank and the Ideal Cement Co., Denver, has been elected chairman of the board of the Graysonia, Nashville & Ashdown, following the reorganization of the railroad.

Charles M. Conway was re-elected president and general manager, with headquarters at Texarkana. **C. K. Boettcher,** chairman of the board of the Denver & Intermountain, **R. J. Morse,** of Denver and **C. D. Nichols** of Oklahoma City were elected vice presidents. **M. O. Matthews** of Ada, has been appointed assistant general manager with headquarters at Nashville, Ark.

George F. Peabody of New York, has been elected vice president of the Mexican Northern.

T. A. Hamilton has been appointed general eastern agent in the executive department of the Waco, Beaumont, Trinity & Sabine, with headquarters at New York.

Lowell White, superintendent of transportation of the Atlantic Coast Line at Wilmington, has been appointed general superintendent of telegraph, mail and express traffic. The position of superintendent of transportation (system) has been abolished.

The following appointments have been made by the Canadian National: **P. G. Russell,** assistant superintendent of the Smithers division with headquarters at Smithers, succeeding **F. G. Jackson,** resigned; **N. P. North,** superintendent, with headquarters at Hornepayne; **R. E. Orr,** assistant superintendent on the Belleville division with headquarters at Belleville; **Edgar W. Burns,** assistant superintendent on the Belleville division with headquarters at Lindsay; **J. H. McDiarmid,** transferred to the staff of the general superintendent of transportation with headquarters at Toronto.

J. O. Bell, superintendent of the Chicago division of the Chicago & Eastern Illinois at Danville, has been appointed superintendent of transportation with headquarters at Chicago succeeding **C. B. Anderson,** assigned to other duties. **P. S. Sampson,** superintendent of the Illinois-St. Louis division at Salem succeeds Mr. Bell as superintendent of the Chicago division, and **E. R. Glidden,** superintendent of the Evansville division succeeds Mr. Sampson as superintendent of the Illinois-St. Louis division. The mileage of the Evansville division has been included in the Chicago division.

W. F. Heiser has been appointed supervisor of safety with headquarters at Danville.

The following promotions have been made by the C. M. & St. Paul: **J. W. Blossingham,** assistant superintendent on the La Crosse and northern division with headquarters at Portage; **D. T. Bagnell,** trainmaster on the river division with headquarters at Minneapolis; **W. J. Hotchkiss,** trainmaster on the Dubuque division, with headquarters at Dubuque; **F. P. Rogers,** trainmaster of the Twin City terminals, with headquarters at Minneapolis.

F. E. Nicholes, superintendent of the eastern division of the Chicago, St. Paul, Minneapolis & Omaha, has been appointed assistant to the general manager, with headquarters at Eau Claire. **C. D. Stockwell,** assistant superintendent, succeeds Mr. Nicholes as superintendent. **F. E. Fuhrman,** assistant superintendent of the western division, has been transferred to the eastern division with headquarters at Eau Claire. **H. B. Congdon,** trainmaster at Spooner, has been appointed assistant superintendent of the western division succeeding **F. E. Fuhrman** who has been transferred to the eastern division.

C. A. Maxwell, trainmaster on the Kansas City, Mexico & Orient at San Angelo, has been appointed assistant superintendent with headquarters at the same point. **R. L. Davis** succeeds Mr. Maxwell as trainmaster.

J. M. Delgado, trainmaster on the Mexican Northern at Escalon, Chih., has been appointed superintendent with the same headquarters.

The following appointments have been made by the Missouri Pacific: **G. W. Griffing,** trainmaster of all districts with headquarters at McGehee; **L. F. Ginochio,** trainmaster of the Lake Providence, Arkansas City and Eudora districts with headquarters at McGehee; **E. B. Stevenson,** trainmaster of the McGehee, Hamburg and Warren districts and McGehee yard with headquarters at McGehee; **O. E. Coyne,** trainmaster of the River, Independence Lexington and Bagnell districts, with headquarters at Jefferson City.

W. G. Templeton, superintendent of the Nashville division of the Nashville Chattanooga & St. Louis at Nashville, has been appointed general manager, with the same headquarters succeeding **W. P. Bruce,** deceased. **W. J. McWhorter,** assistant superintendent of the Nashville division, succeeds Mr. Templeton. Other appointments are as follows: **W. A. Swindell,** assistant superintendent of the Nashville division with headquarters at Bruceton; **M. O. Armstrong,** trainmaster at Atlanta.

Don S. Colby has been appointed appointed assistant superintendent of the Fargo division of the Northern Pacific with headquarters at Staples succeed-

ing **J. F. Alsip**, transferred to the Tacoma division.

Thomas Summers has been appointed trainmaster at Pasco succeeding **Oscar Revling** who has been transferred to Spokane.

M. C. Williams, assistant superintendent on the Oregon-Washington at Portland, has been appointed acting superintendent of the third division with headquarters at Spokane succeeding **W. Connolly** who has been granted leave of absence.

The following appointments have been made by the Pennsylvania: **C. A. Plotner**, trainmaster on the Cincinnati division with headquarters at Cincinnati; **F. L. Davis**, trainmaster on the Logansport division, with headquarters at Logansport succeeding **W. T. Henderson**, resigned; **E. A. Burchiel**, trainmaster on the Indianapolis division with headquarters at Indianapolis; **H. C. Kirby**, assistant trainmaster and division operator on the Indianapolis division.

Fred M. Hair, trainmaster on the Southern Railway at Charlotte, has been appointed superintendent of the Charleston division, with headquarters at Charleston.

R. N. Gardner, chief clerk in the operating department of the Southern Pacific, Pacific lines, at San Francisco, has been appointed office manager in the office of the general manager and the first assistant general manager of the Pacific lines at the same point.

W. O. Uffelman has been appointed trainmaster of the Tennessee Central with headquarters at Nashville succeeding T. W. Burke, deceased.

O. W. Tuckwood, traffic manager and auditor of the Trona at Trona, Cal., has been appointed general manager with the same headquarters.

Financial and Legal

James B. McDonough, Jr., assistant district attorney for Arkansas and Oklahoma for the Kansas City Southern, with headquarters at Ft. Smith, has been appointed secretary and treasurer of the Arkansas Western, with headquarters at the same point.

J. A. Ackroyd, secretary of the Copper Range, with headquarters at Boston, and **John M. Wagner**, purchasing agent, with headquarters at Houghton, have in addition been appointed assistant treasurers.

John G. Wormick has been appointed assistant auditor of disbursements of the Reading, with headquarters at Philadelphia.

Purchases and Stores

J. H. Waterman, superintendent of timber preservation on the Burlington, with headquarters at Galesburg, retired September 1 under the pension rules of the company at the age of 74 after nearly 47 years in its service.

W. F. Jones, general storekeeper of the New York Central Lines, Buffalo and east, at West Albany, has been appointed purchasing agent, dining service, with headquarters at New York City. **B. W. Griffith** has been appointed general storekeeper at West Albany.

Traffic

R. V. Oldham, district passenger agent on the Wabash at Indianapolis, has been appointed assistant general passenger agent of the Ann Harbor, with headquarters at Toledo.

Philip S. Lottenville, general agent for the Chicago & Eastern Illinois, at Chicago Heights, has been appointed general agent also for the Chicago Heights Terminal Transfer, a newly created position.

The following appointments have been made by the Erie: **Eugene W. Vail**, assistant general freight agent, with headquarters at Cincinnati, succeeding **C. P. Morse**, retired; **James M. Skaehill**, division freight agent, at Meadville; **Francis L. Collins**, division freight agent, at Huntington, Ind., succeeding **J. H. Hackett**, retired; **Eugene J. Dean**, division freight agent, at Dayton, succeeding **C. L. Farrell**, resigned; **David R. Thompson**, foreign freight agent, with headquarters at Chicago; **Howard R. Farrell**, traveling freight agent, with headquarters at Huntington; **Richard L. Murphy**, general agent, at Louisville, succeeding **Theo. Lengmiller**, retired; **Beecher A. Rockwell**, general agent, and **Frank H. Dowle**, assistant general agent, at Detroit; **George F. Daniels**, general agent at St. Louis; **Clifford V. Harrow**, general agent at Des Moines; **Eugene W. Burnett**, commercial agent at Toledo; **Lee R. Breckenridge**, commercial agent at Columbus; **Edward R. Munford**, commercial agent at Cleveland; **Louis W. Hughes**, commercial agent at Los Angeles; Harry F. Studt, commercial agent at Kansas City; **John C. Bannattyne**, commercial agent at San Francisco, succeeding **W. M. Biggerstaff**, deceased; **Allan Barr**, assistant general agent at Akron; **P. R. Davenport**, traveling freight agent, with headquarters at New Haven; **Louis McAbee**, traveling freight agent, with headquarters at Baltimore; **George E. Robb**, traveling freight agent, with headquarters at New Haven; **August A. Guenther**, coastwise freight agent, with headquarters at New York; **M. A. Demsen**, commercial agent at Toronto; **H. Herrman**, commercial agent at New York; **H. E. Fee**, commercial agent at Baltimore; **D. C. Norris**, commercial agent at New Haven; **E. P. Vanderloo**, commercial agent at Albany; **C. B. Courtright**, commercial agent at New York; **Robert L. Miller**, commercial agent at Memphis.

E. F. Adams, assistant general passenger agent of the Gulf, Colorado & Santa Fe at Galveston, has been appointed general passenger agent with headquarters at the same point succeeding **W. S. Kennan**, deceased. **L. R. Wheat**, succeeds Mr. Adams as assistant general passenger agent.

The headquarters of **H. N. Clarke**, general southwestern agent of the Kansas City, Mexico & Orient, has been moved from Ft. Worth to Dallas. **N. S. Mickley**, general agent at Dallas, has been transferred to Ft. Worth.

The Kansas City Southern and the Texarkana & Fort Smith have opened an office at 609 Colcord Building, Oklahoma City, in charge of **L. S. Wickes**, traveling freight agent.

The following appointments have been made by the Michigan Central: **Edward F. Leuchtmann**, chief of the tariff bureau, succeeding **C. A. Hunt**, who has resigned to enter the service of another railroad; **James Finlay**, assistant general freight agent in charge of industrial development; **Norbert J. Brennan**, assistant general freight agent in charge of coal, coke and ore traffic; **Alfred E. Sauer**, division freight agent. Headquarters for all at Detroit.

R. D. Williams, assistant general freight agent of the Missouri-Kansas-Texas at St. Louis, has resigned to become a member of the rate committee of the Southwestern Freight Bureau at St. Louis.

Clinton Woodring has been appointed traveling freight agent with headquarters at Seattle.

J. H. Day, general freight agent of the Nickel Plate at Cleveland, has been appointed acting freight traffic manager in charge of legislation and traffic matters with headquarters at the same point, succeeding **Edwin Kleuver** who has been granted leave of absence because of illness. **R. A. Williamson**, assistant general freight agent at Cleveland, has been appointed acting general freight agent, and **H. L. Baird** has been appointed assistant general freight agent.

F. J. Osborne has been appointed eastern dairy agent of the New York Central and the West Shore, with headquarters at New York, succeeding **S. D. Parkhurst**, deceased. **F. L. Wortman** has been appointed assistant eastern

dairy agent with the same headquarters.

T. B. Collett has been appointed freight agent of the Norfolk & Western with headquarters at Roanoke.

Harrison Will, city passenger agent of the St. Louis-San Francisco at St. Louis, has been appointed division passenger agent for the St. Louis territory succeeding **Richard C. Gentry** who has resigned.

L. R. Everett, division freight and passenger agent of the coast lines of the Santa Fe at San Bernardino, has been appointed assistant general passenger agent with headquarters at San Francisco.

G. F. Allen has been appointed general agent of the Seaboard Air Line, and **M. D. Boyd**, commercial agent with headquarters at Gainesville. **C. E. Muller**, assistant freight traffic manager has resigned and the position held by him is abolished. **Martin C. Burqhard** has been appointed commercial agent with headquarters at Havana. The position of general agent, formerly held by **H. L. Hill**, now deceased, has been abolished.

A. B. Reynoldson, assistant general agent of the Southern Pacific at Liverpool, Eng., and London, has been appointed general agent for Great Britain with headquarters at the same points succeeding **R. G. Bonsor**, deceased.

I. W. Carter, district passenger agent of the Union Pacific System at New York, has been promoted to assistant general passenger agent with headquarters at Denver succeeding **J. S. McClure**, transferred. **H. A. Lawrence** succeeds Mr. Carter as district passenger agent at New York.

Harold K. Faye, freight traffic manager of the Western Pacific; **J. D. Mansfield**, general freight agent; **John F. Bon** and **W. J. Shotwell**, assistant general freight agents, and **B. F. Nevins**, general livestock agent, all with headquarters at San Francisco, have been appointed to similar positions with the Sacramento Northern and the Tidewater Southern. **R. D. Williams**, traffic manager of the Sacramento Northern, with headquarters at Sacramento, has been appointed assistant freight traffic manager of the Western Pacific, the Sacramento Northern and the Tidewater Northern.

Mechanical

B. Pendleton has been appointed general foreman of the Carleton Place shop of the Canadian Pacific, with headquarters at Montreal, succeeding **F. Stewart**, transferred.

J. S. Hagan has been appointed electrical engineer of the Central of New Jersey with headquarters at the Elizabethport shops.

A. W. Standiford, master mechanic of the Illinois-St. Louis division of the Chicago & Eastern Illinois, with headquarters at Salem has been transferred to the Chicago division with headquarters at Danville succeeding **W. F. Heiser**, transferred to other duties. **E. J. Wegmiller**, master mechanic of the Evansville division, succeeds Mr. Standiford at Salem.

E. C. Roddie, master mechanic on the Illinois Central at McComb, has been appointed superintendent of shops, with headquarters at Paducah, a newly created position. **J. N. Chapman**, general foreman in the locomotive department at New Orleans, succeeds Mr. Roddie as master mechanic at McComb.

H. T. Bentley

Harry T. Bentley, general superintendent of motive power and machinery of the Chicago & North Western, at Chicago, retired September 1 under the pension rules of the company. Mr. Bentley was born June 4, 1862, in London, England, and was educated at Dulwich College. He began railway work in 1877 as an apprentice and machinist. Beginning in 1887, and for five and a half years, he was foreman of the enginehouse of that road at Chester. Mr. Bentley began work for the Chicago & North Western in 1892 as machinist in the Chicago shops. Later he became foreman of the enginehouse at Boone, Ia., and from 1895 to 1898 was foreman at Belle Plaine, Ia. He was then transferred to Clinton, as general foreman of shops, was master mechanic of the Madison division; he was then transferred to the Iowa division as master mechanic on January 1, 1900, where he remained until August 31, 1902, when he was appointed assistant superintendent of motive power and machinery at Chicago, and in 1913 was made superintendent of motive power and machinery.

From February 2 to June 19, 1918, he was at Washington, D. C., as assistant director of transportation (mech.), under Carl Gray, and in that position was made chairman of the standardization committee, organized to prepare plans and specifications for standard locomotives and cars. When that work was finished he returned to his old position as superintendent of motive power and machinery. He was appointed general superintendent of motive power and machinery on May 1, 1922.

Mr. Bentley was president of the Western Railway club 1906-1907; president of the American Railway Master Mechanics Association 1911-1912, and president of the International Railway Fuel Association 1912-1913. He was chairman of the sub-committee of mechanical officials of the General Managers' Association of Chicago for the prevention of smoke in Chicago, and also a member of the headlight committee of the Master Mechanics' Association, and chairman of the American Railway Association committee on locomotive design and construction for many years. Mr. Bentley also is a member of the American Society of Mechanical Engineers.

Charles Campbell has been appointed mechanical engineer of the New York Central and the Ottawa & New York, with headquarters at New York City.

George I. Wright, assistant electrical engineer of the Illinois Central (Chicago Terminal Improvement) has been appointed engineer of electric traction of the Reading with headquarters at Philadelphia, a newly created position. **J. S. Thorp**, distribution engineer, succeeds Mr. Wright as assistant electrical engineer.

R. A. Whitsitt, assistant master mechanic of the Tennessee Central, has been appointed master mechanic succeeding **E. L. Mauk**, deceased. The position of assistant master mechanic has been abolished. **T. A. Saunders**, general foreman, car department, has been appointed master car builder.

Civil

W. O. Frame, district engineer of maintenance of way on the Illinois district of the Burlington, with headquarters at Galesburg, has been transferred to the Iowa district with headquarters at Burlington, succeeding **D. Cameron**, assigned to other duties. **G. E. Yahn**, roadmaster at Old Monroe,

succeeds Mr. Frame as district engineer of maintenance of way in the Illinois district.

Frederic W. Alexander, district engineer of the British Columbia district of the Canadian Pacific at Vancouver, has been appointed engineer of maintenance of way of the western lines with headquarters at Winnipeg.

C. H. Zentmeyer, assistant division engineer of the Chesapeake & Ohio at Clifton Forge, has been appointed division engineer with the same headquarters succeeding **J. D. Keiley,** deceased. **R. G. McGehee** succeeds Mr. Zentmyer as assistant division engineer.

H. H. Orr has been appointed superintendent of signals and telegraph for the Chicago & Eastern Illinois with headquarters at Danville. **Chas. McCormack,** former superintendent of telegraph, has retired after 44 years of continuous service. The offices of signal engineer, and superintendent of telegraph are abolished.

M. H. Struaghan, superintendent of the Murfreeboro-Nashville Southwestern at Murfreesboro, has been appointed chief engineer with headquarters at the same point.

H. W. Brown, assistant engineer in the western region of the Pennsylvania at Chicago, has been appointed division engineer of the Toledo division at Toledo succeeding **J. K. Sherman** who has been appointed assistant engineer in the office of the chief engineer of maintenance of way of the western region at Chicago.

The Late W. P. Bruce.

A. P. Gardner, division engineer on the western division of the Wabash at Moberly, has been appointed engineer of maintenance of way of the Ann Harbor with headquarters at Owosso, Mich.

Obituary

W. P. Bruce, vice president and general manager of the Nashville, Chattanooga & St. Louis died at Nashville August 15, of heart disease, aged 66. Mr. Bruce was born in the old town of Jefferson, Rutherford county, Tenn., October 5, 1861. After attending the Springfield Academy he entered the railway service at the age of 15 as agent and operator on the St. Louis & Southwestern (now a part of the Louisville & Nashville system). He became train dispatcher at Evansville at the age of 19, and until 1900 acted successively as agent for the Decatur & Evansville (now a part of the Illinois Central system); as train dispatcher on the Burlington; on the Gulf, Colorado & Santa Fe; on the Union Pacific; on the East Tennessee, Virginia & Georgia (now a part of the Southern) and on the Louisville & Nashville, and as yardmaster on the Louisville & Nashville. From 1900 to 1902 he was trainmaster for the Nashville terminals, and during the latter year was made superintendent of terminals, which position he held until 1918, when he was named general manager of the Nashville, Chattanooga & St. Louis. He was elected vice president and general

CHANGE OF ADDRESS

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manager in March, 1926, which position he held until his death.

Carroll P. Cooper, comptroller of the Fruit Growers Express Co., died August 3 at Washington, following an attack of ptomaine poisoning.

Judge Elbert H. Gary, chairman and chief executive officer of the United States Steel Corpn., died August 15 at his home in New York, aged 81.

Joseph H. Gates, general manager in the central department of the American Express Co., died at his home in Chicago August 16.

J. R. Mahon, general live stock agent of the Denver & Rio Grande Western, died at his home in Denver, August 20, after a short illness.

Turnbull Murdoch, president and general manager of the Baltimore, Chesapeake & Atlantic and the Baltimore & Virginia Steamboat Co., died at his home in Rodgers Forge, Md., August 4, of heart disease.

Ernest B. Perry, president and general manager of the Industrial Works, Bay City, died August 7, after a short illness.

John E. Sexton, vice president of the Eureka Nevada, died at San Francisco August 9, aged 61.

Charles L. Stone, who retired as passenger traffic manager of the Missouri Pacific in July, 1926, after serving for 19 years in that capacity, died at New York August 1 following an illness of about a year.

Albert G. Welch, president of Edwin S. Woods & Co., Chicago, and a member of the board of directors of the Bradford Corpn., died in Chicago August 8, of pneumonia.

Supply Trade Notes

C. G. Emil Larsson, assistant chief engineer of the **American Bridge Co.**, has been appointed chief consulting engineer in charge of technical engineering and bridges, with headquarters at New York. **James H. Edwards**, assistant chief engineer, has been appointed chief engineer, in charge of engineering forces and buildings.

W. E. Day, formerly of the purchasing and stores department of the Southern Pacific, has been appointed representative of the railway appliance division of the **American Fork & Hoe Co.**, with headquarters in the St. Clair building, San Francisco.

The **Bethlehem Steel Co.** has established three divisions of sales, each in charge of a vice president as follows: general sales, **E. S. Knisley**, vice president; **Paul Mackall**, general manager of sales; structural and plate sales, including fabrication and erection of buildings and bridges, **G. H. Blakeley**, vice president; **E. E. Goodwillie**, general manager of sales; railway freight and passenger car and machinery sales, **G. W. Struble**, vice president. In addition to the foregoing changes **J. M. Gross** is now vice president in charge of traffic; **H. C. Crawford** is traffic manager; **R. E. McMath** is vice president in charge of finances and will also retain the office of secretary; all with headquarters at Bethlehem, Pa.

Charles Gilman has been elected vice president of the **Canadian Concrete Products Co., Ltd.**, with headquarters at 50 Church street, New York City, and 312 Transportation building, Montreal, succeeding **Paul Kircher**, deceased.

Charles G. Olson, representative of the **Chain Belt Co.** at Milwaukee, has been transferred to Detroit.

J. H. Kenney, general sales manager of the Cyclone Fence Co., Waukegan, Ill., has been appointed general manager. This company is said to be planning an addition to its plant to cost $18,000.

The **General Railway Signal Co.**, has acquired from the **Miller Train Control Corpn.**, exclusive rights to make and sell the Miller devices in foreign countries.

A consolidation of the **Industrial Works**, Bay City, and the **Brown Hoisting Machinery Co.**, Cleveland, has been approved by the directors of the two companies and now awaits the approval of the stockholders. The new company will be known as the **Industrial Brown Hoisting Corpn. A. C. Brown**, president of the Brown Hoisting Co., will be president of the new company.

Henry A. Strauss, assistant vice presi- of the **Inland Steel Co.**, Chicago, has been appointed vice president.

The **Thomas L. Mount Co.**, New York, has taken over the sole railroad agency for the Rochlitz automatic water still, manufactured by the **Weber Brothers Metal Works**, Chicago.

The **Hyatt Roller Bearing Co.**, Newark, announces that the **O'Fallon Co.**, St. Louis, has been appointed direct sales representative of its company. The O'Fallon Co. will handle exclusively the Hyatt railroad journal box and roller bearings for steam and electric railroad use in the central southwest territory.

Walter D. Schleiter, vice president of **Dilworth, Porter & Co., Inc.**, has been appointed president of the **Verona Tool Works**, succeeding **William F. Hart**, who has resigned to go with the Bethlehem Steel Co. **W. W. Glosser**, general sales manager of the Verona Tool Works, at Verona, has been appointed vice president and general manager, with headquarters at Pittsburgh.

J. F. Craig, representative of the **Westinghouse Air Brake Co.**, at New York, has been appointed assistant eastern manager. **H. B. Gardner** has been appointed assistant to the resident vice president at New York. **N. M. Forsythe**, inspector in the automotive division at St. Louis, has been appointed representative in the automotive division at Pittsburgh. **P. G. McGinnis**, who resigned in 1925 as representative of the Westinghouse Air Brake Co., at Chicago to go with an automotive company, has returned to the Westinghouse organization as representative of the **Westinghouse Friction Draft Gear Co.**, with headquarters at Chicago.

The **Mack International Motor Truck Corpn.**, New York, announces the following changes in personnel in the southern division: **J. C. Rowold**, formerly branch manager at Miami, is now branch manager at Charlotte; **R. W. Huffman**, manager of the St. Petersburg branch is now manager of the Miami branch; **W. N. Costello** has been appointed manager of the St. Petersburg branch.

William E. Brown, manager of the central station department of the New York district of the **General Electric Co.**, has been appointed New York district sales manager.

The **Waugh Equipment Co.**, Chicago, has appointed the **O'Fallon Co.**, Arcade building, St. Louis, as exclusive representative to handle sales and distribution of the Waugh company's various specialties to railroads and electric lines in St. Louis and middle west section of the United States.

W. H. S. O'Brien, formerly with the Waugh Equipment Co., has joined the staff of the **O'Fallon Co.**, St. Louis. Mr. O'Brien's headquarters are at St. Louis. He will be engaged in general sales and service work among transportation companies in the southwest territory.

The JORDAN is an all-the-year-'round machine. It spreads materials, digs ditches, moves earth, rips out ice, fights snow.

Jordanized Ditchers aid proper drainage.

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The load and moving parts of the car are balanced throughout dumping operation.

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THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
COLUMBUS, OHIO

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of paying $2,500 for a car, loading it with $6,000 worth of lading and allowing the entire outfit to be damaged or destroyed because the draft gear (no matter how good a gear was used) did not properly protect the *car and contents* from switching and other shocks in handling?

For 25 years

we have been supplying car and lading protection to leading railways.

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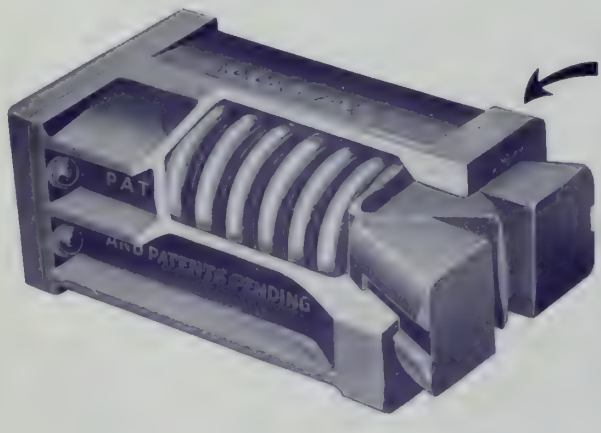

This is WHAT does it.

May we show you how?

Unless you REALLY KNOW, you are losing money for your road.

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COMMEMORATION OF THE BALTIMORE & OHIO CENTENARY SEPT. 24-OCT. 8, 1927

100 YEARS OF THE RAILROAD

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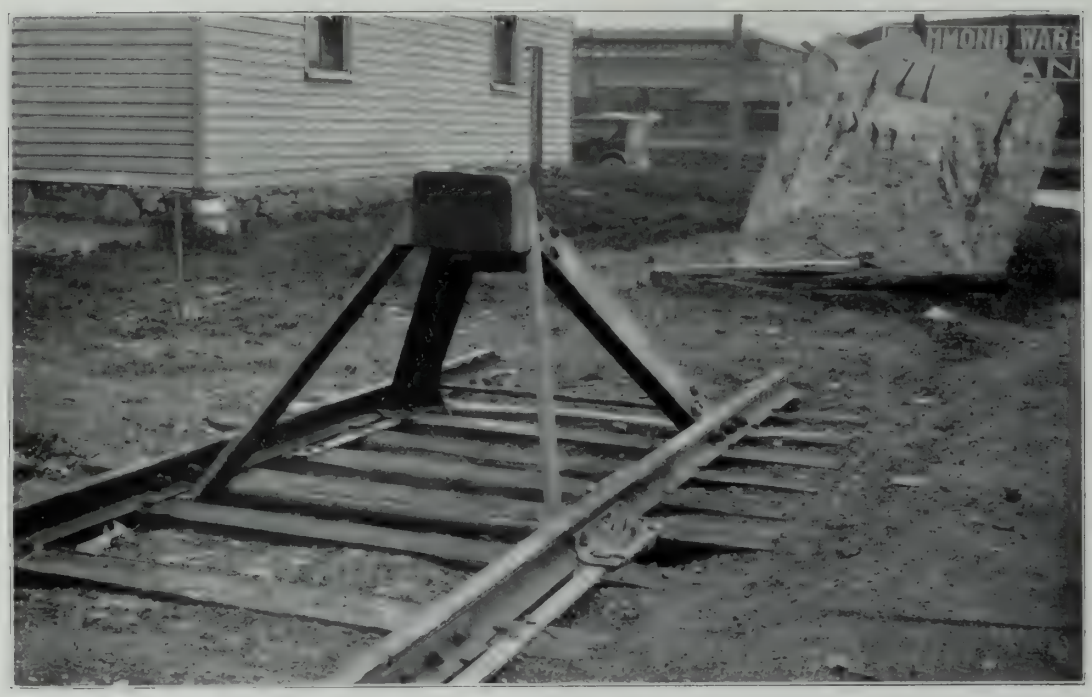
VOL. I OCTOBER 1927 NO. 6

This post is never destroyed



Hayes Type W Bumping Post in track. The original concrete bumping post used on this track is shown broken off its foundation and turned over at the upper right.

You may have noticed the tone of finality and assured satisfaction some men use in speaking of concrete bumping posts. In line with the slogan "concrete for permanence" they believe that a concrete bumping post will last forever.

The big chunk of reinforced concrete shown above was installed at the end of a side track for a bumping post. It remained in place only a short time; the first car which hit it started its destruction. Why? Because while it had mass there was little real strength and no elasticity.

The Hayes Type W Bumping Post which succeeded it uses all of the strength and elasticity of the track structure. The rails, ties and ballast must all move before the post is knocked out.

Another vital difference is that after the concrete post is knocked out it is more than 100% loss; it must be broken up and carted off to the dump.

When a Type W Post is knocked out it can be put back in use again for a fraction of its original cost because the post is usually not damaged but the track structure gives way. A Type W Post stands severe service and stops the cars with little damage either to the equipment or to the post.

The same men who have designed and made Hayes Derails for 23 years are responsible for the Type W Bumping Post. You know the Hayes Derail; we ask you to get acquainted with the Type W Bumping Post. Try it where you are destroying other posts.

Hayes Track Appliance Co., Richmond, Indiana

You Could Hang A 70 Ton Freight Car

On a Schaefer Loop Hanger

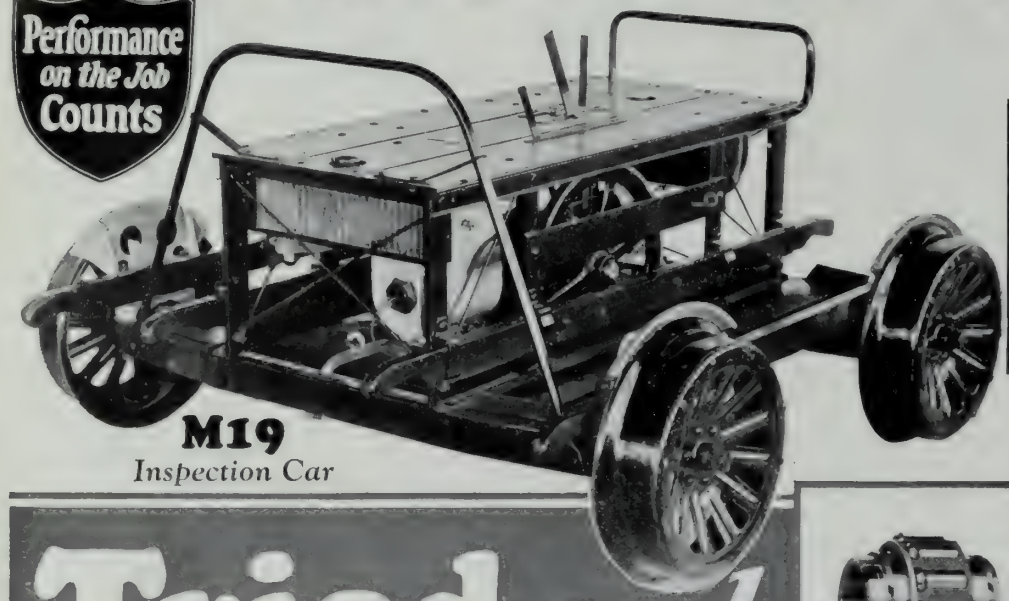
SCHAEFER Loop Brake Hanger is actually strong enough to support a 70 ton freight car—with a good margin of safety.

Holding up a brake beam is literally child's play for a hanger that would support a full sized freight car. Schaefer Loop Hanger is much stronger than it need be, perhaps, but the additional strength is comforting assurance of freedom from dropped brake beams and attendant grief.

If you are not using Schaefer Loop Hangers, or if you are not thoroughly familiar with their exclusive advantages—drop-forged, one-piece (weldless) construction, 50% larger section cross members, elimination of the pin, ease of application—write for complete advantages.

Fairmont

Performance on the Job Counts



M19
Inspection Car

FAIRMONT RAILWAY MOTOR CARS

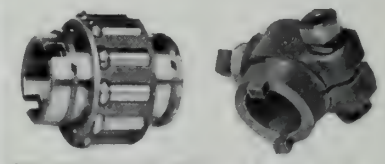
Inspection—M19

Light Section—M14

Section—A2, M2, S2

Gang—AT2, MT2, ST2

Tried *and* Proved Design



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Anyone can adjust a Fairmont bearing on the car—simply shift the thrust collar and tighten clamp bolt and set screw. This feature alone is an important time saver and keeps cars on the job where you want them.

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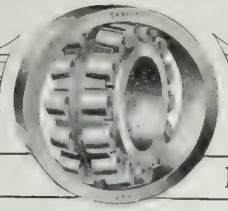

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SKF *Journal Bearings Cannot Bind or Score*

NOTHING less than complete flexibility will satisfy the requirements of a railroad journal bearing.

The axle must be free to assume any of the various positions with respect to the pedestal that service conditions demand.

In the SKF Journal Bearing the spherical surface of the outer race provides complete universal freedom of movement and eliminates all possibility of clamping stresses being imposed on the bearing regardless of the position of the axle.

This construction has overcome one of the chief obstacles to a successful anti-friction journal bearing.

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Men in important positions, of great responsibilities, demand facts proven by experience.

The fact that the Grip Nut Company is now twenty-one years old, that twenty-one years ago they made the first Grip Nut and that they have continued their work of development and progress is proof of the merit of their product.

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Transportation

The Monthly Magazine of the Transportation Industries

OCTOBER, 1927

VOLUME ONE NUMBER SIX

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October Meetings

MEETINGS of much importance to practically all branches of transportation are to take place in October in various parts of the country. One of these will be the annual convention and exhibit of the American Electric Railway Association, October 3-7, in the Public Auditorium at Cleveland.

The telegraph and telephone section of the American Railway Association will meet at the Willard in Washington, October 4-6.

October 18 to 21 the National Association of Railroad and Utilities Commissioners will hold its 39th annual meeting at the Baker hotel, Dallas.

The Society of Automotive Engineers, transportation section, is to meet October 26 and 27 at the Hotel Sherman, Chicago.

The American Railroad Bridge and Building Association, with an exhibit by the Supply Men's Association, is to meet at the Nicollet hotel, Minneapolis, October 18 to 20.

October 25 to 28, the Associated Railway Electrical Engineers with an exhibit by the Supply Manufacturers' Association, is to meet at the Hotel Sherman, Chicago.

First national meeting of the Fuel Division, A.S.M.E., at St. Louis, Oct. 10-13.

American Assn. of Dining Car Supts., Washington, October.

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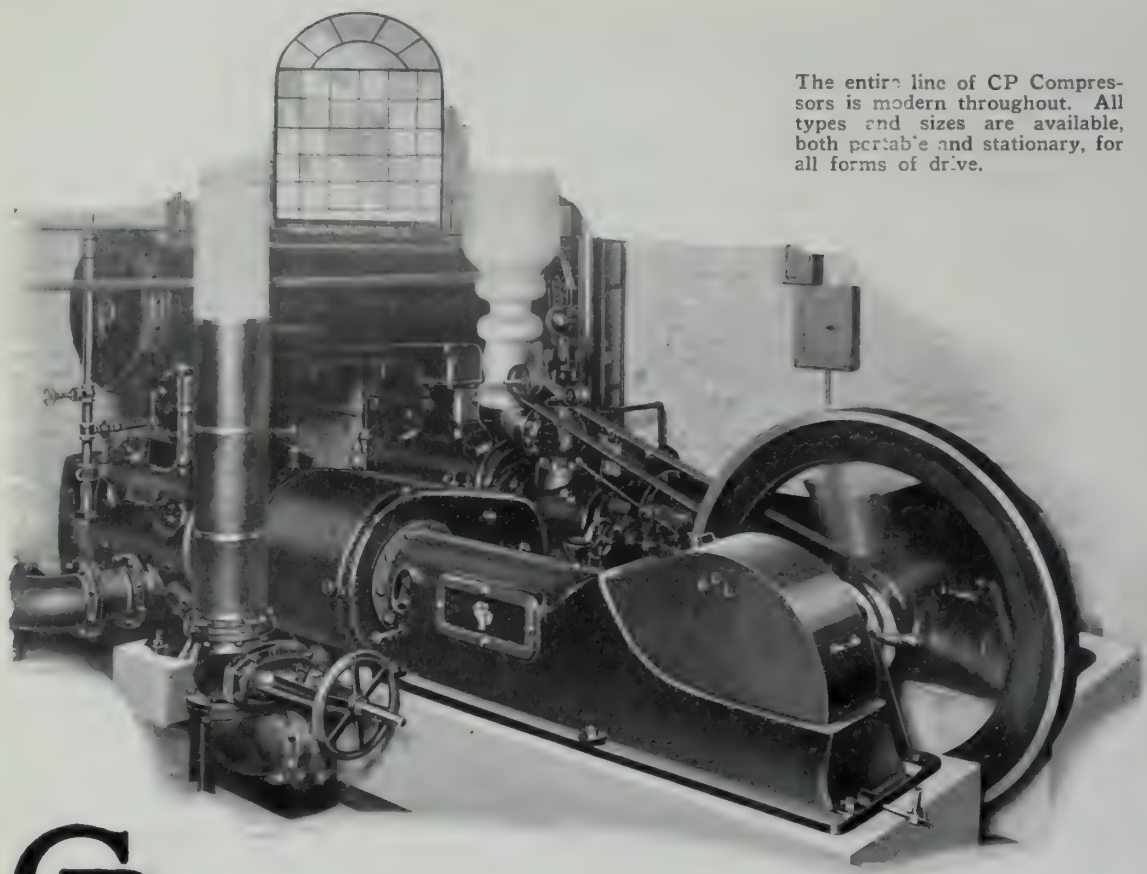

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"Compound Steam Driven Two-Stage Compressor"

CP STEAM driven compressors embody all latest refinements making for economy and reliability.

Perfectly balanced piston steam valves permit economical use of high-pressure, superheated steam. Operation may be either condensing or non-condensing at maximum economy because of wide range of steam cylinders available. The perfect lagging of the cylinders, valves and heads and the isolation of live and exhaust steam effect high economy.

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It Was A Wonderful Birthday Party

The Baltimore & Ohio Centenary

By Harold A. Smith

Hail! the Baltimore & Ohio
'Tis the road of service fine.
Hail the men whose toil has made it
A mighty transportation line.

HAD Barnum been alive and able to drop into the city of Baltimore on Saturday, September 24, he would have been obliged to change his motto and admit to Daniel Willard and Edward Hungerford that he could no longer say he was running the "greatest show on earth." The "Fair of the Iron Horse" which opened that day to commemorate the hundredth anniversary of the first railroad in the United States operated for the public handling of passengers and freight, the Baltimore & Ohio, was the greatest show ever staged by one corporation.

Tex Rickard may have staged a brief exhibit two days before in Chicago for a $3,000,000 gate, but the Baltimore & Ohio gave a full day of entertainment and education, a demonstration of comradeship to the public without charge. If one man may judge from seeing, hearing and being there, the gate receipts will aggregate more than three million in good will and better understanding of the railroad problem. It has been proved in recent years that the greatest public relation work that can be done is to take people into your confidence, show them your problems, and make them realize that after all the railroads are the public's servants, and that they can serve best only when permitted to earn a fair return. Here, on one great afternoon, were the public, the politicians and the railroad men, meeting to celebrate, and pay homage, to the great industry which, as commonly acknowledged, has meant more to the development and prosperity of our nation than any other one agency.

Seldom does such a sight greet a visitor as Baltimore unfolded to its guests during the exhibit. The city's gala dress was wonderful. All the large buildings were draped

Indian Travois in Pageant Procession. Blood and Piegan Tribes of the Blackfeet Nation, Glacier National Park.

with flags, pictures and bunting. The stores, no matter how large or how small, vied with one another in developing window displays of many kinds, typifying the development of 100 years of railroading. There were the mayor's headquarters, information booths, wax ladies in the department store windows dressed in the styles of varying periods. There were locomotive models, miniature cities and birthday greetings interspersed in the windows with men's shoes, diamond wrist watches and ladies' unmentionables. No class of merchandise was immune. Everything and everybody offered birthday greetings to the B & O, and wished it a brilliant future. Many of the large concerns gave their advertising space in the daily papers to congratulatory messages. On every hand, one saw such greetings as this:

To have rendered public service for so long a time is indeed worthy of commendation.

Baltimore may well be proud of the fact that the history of the American railroad began here, and that its pioneer, the Baltimore & Ohio Railroad, has lived and prospered throughout a century of service. That the present prosperity of the Baltimore & Ohio is the direct result of its adherence to its ideals is a fact of which we are firmly convinced. We know that no organization can live and flourish unless it recognizes its obligations to those whom it serves and to those who serve it—that success comes only to those who observe the principle of mutuality in all their dealings.

The Indian Ox Cart, a Colorful Item in the Great Pageant, Its Solemn-Faced Driver Mightily Impressed by His Job.

A century is a long life for a man or an institution—and only fundamental soundness and right living can make possible so full a measure of years. We are proud that Baltimore is the home of the Baltimore & Ohio Railroad—and to its officials and executives, as well as to its entire personnel, we extend our sincere congratulations. Yours is an organization over whose accomplishments the country at large, Baltimoreans and Marylanders in particular, may well feel proud. We are happy to be one of your neighbors.

The Fair of the Iron Horse was staged at Halethorpe on the southwestern outskirts of Baltimore. As one approached the large 1,000 acre tract used for the exhibit grounds, once a part of Ross Wiman's farm, whose owner was once an employe of the railroad for whom one of the pioneer engines built in 1869 was named, the visitor was greeted by the sight of hundreds of flags. A great blue and white canopy more than 1,000 feet long covered the 12,000 seats in the grandstand. Across from this stand is the Hall of Transportation, 502 feet long, built of brick and steel, resplendent with its white pillared entrances and glistening tower. The visitor next saw the Allied Service, the Traffic, the Maryland

The Horse Car Pioneer, a Replica of the One Which, in May, 1830, Began Its Daily Trips Between Baltimore and Ellicott Mills.

The Original "Atlantic," Built in 1832. Weight 6½ Tons. In Service on the B & O for 61 Years; Kept in Good Condition for 95 Years. The Car Is an Imlay Vehicle, Used in 1831.

buildings, fine structures of brick, the Old Tavern, a replica of an early inn, used as the administration offices, and the restaurant and concession booths, and everywhere a revelation of broad green lawns, flower gardens carefully planned, prepared walks, adding to the charm of the beautiful picture.

With the people everywhere the one question, as usual upon such occasions, seemed to be "when does the show start?" On opening day the pageant was preceded by brief addresses made by Daniel Willard and Governor Albert C. Ritchie.

"One hundred years ago this year," Mr. Willard said, "a small group of Baltimore business men decided to build a railroad from Baltimore to the Ohio River for general transportation purposes. A charter was secured from the Maryland legislature. A company was organized, money was raised and construction was begun. The Baltimore & Ohio Railroad, as we know it today, is the result of that beginning, plus the continuous growth of one hundred years.

"In the pageant which will move past the reviewing stand, you will see some of the different forms of transportation which preceded the railroad, followed by a reproduction of a part of the civic parade and pageant that marked the laying of 'The First Stone,' July 4, 1828. You also will see moving, with its own power, an accurate reproduction of the first steam locomotive built in America, and following it you will see examples, most of them originals, of each distinctive type of locomotive used on the Baltimore & Ohio during the last century.

The William Galloway, Named for the Grandfather of C. W. Galloway, Now Vice President of the Baltimore & Ohio. A Working Replica of the Lafayette, First Locomotive on the Road With a Horizontal Boiler. Built in 1837.

"A number of other railroad companies in the United States, Canada and England have very kindly sent to this 'Fair of

the Iron Horse' examples of their early as well as of their modern practice. We are under special obligations to the Great Western Railway Co. of England for sending us one of their most modern passenger locomotives, the King George V.

"While we shall show by actual example how the railroad track, bridges, cars and locomotives have developed during the passage of a century, I venture to hope that we have not wholly neglected those higher values which rest upon a basis of sympathetic human relations and understanding. A railroad is more than a lot of materials made up into tracks, cars and locomotives. A railroad also connotes a group of human beings, all more or less skilled, some highly so, and all inspired with a feeling of loyalty toward each other and to the property with which they are connected. Such measure of success as has been achieved by the Baltimore & Ohio Co. during its long career has been due in no small degree to the ability of its management and to the loyalty and cooperation of its employes in all grades of service."

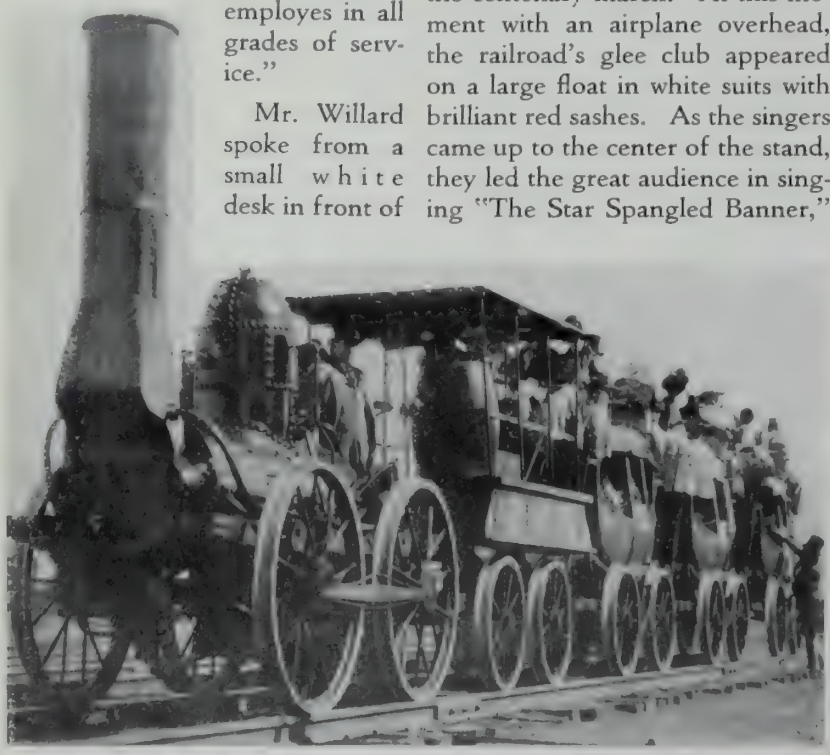
This Is the Real Thomas Jefferson, Built in 1835. First Engine to Operate in Virginia. In the Pageant Under Its Own Power.

Mr. Willard spoke from a small white desk in front of the grandstand and his voice was carried to every part of the stand through loud-speakers.

Governor Ritchie, presented by President Willard, spoke almost as briefly. At the conclusion of his address, the Baltimore & Ohio centenary band marched up and down in front of the stand, playing "Hail to the Baltimore & Ohio," the centenary march. At this moment with an airplane overhead, the railroad's glee club appeared on a large float in white suits with brilliant red sashes. As the singers came up to the center of the stand, they led the great audience in singing "The Star Spangled Banner," followed with the words of the Baltimore & Ohio centenary march, and concluded as the float moved away with "I've Been Working on the Railroad."

After the singing, Charles E. Coburn, a veteran actor, mounted the little white stand dressed in his black cap and gown, and announced to the assembled multitude, through amplifiers scattered everywhere, the coming features of the pageant, each of which he explained. First came the Indian warriors of the Blood and Piegan tribes of the Blackfeet nation, brought from the Glacier National Park through the courtesy of the Great Northern Ry. In long eagle-feathered headdresses, mounted on their ponies, they rode furiously past the grandstand, and then returned to lead their squaws and children in review. Some are on horseback, dragging their crude travois with the children riding behind. These were followed by oxen pulling the old two-wheeled carts, one of the oldest forms of transportation.

Now the floats appeared. The first typified Father Pere Marquette standing at the prow of an Indian canoe, accompanied by Joliet as he sights the Mississippi. Another showed the crude bateau



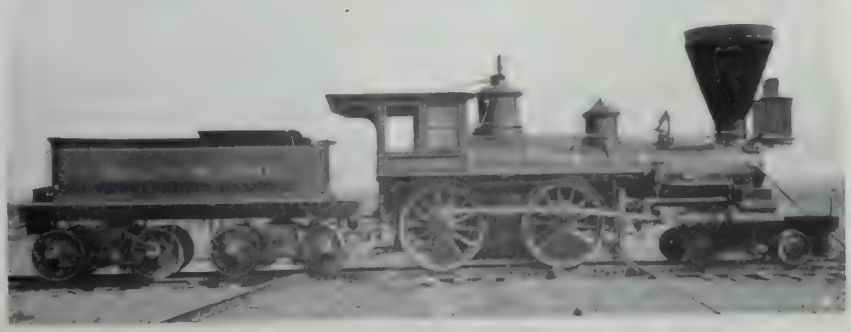
And Here We Have the De Witt Clinton, the New York Central's Contribution to the Centenary, Its Passengers Smiling and Happy.

Replica of Peter Cooper's Tom Thumb. This Little Engine Proved the Practicability of Steam Power. Said to be the First American-Built Locomotive.

in which the first settlers traveled the interior rivers. Four oxen drew a huge Conestoga wagon out of which peered men and women and children dressed in the costumes of a hundred years ago. Another Conestoga wagon was drawn by a span of mules, accompanied by emigrants on horseback. Next an old fashioned canal boat with its passengers in hoop skirts and beaver hats went by on a float. An ancient stage coach came along, the Kearsage, now owned by Henry Ford, and occupied by some of the B & O family in costumes of the time. Fred Stone's old coach and others followed.

We arrive now, according to Mr. Coburn's announcement, at a point where the picture changes. These modes of transportation offered no full solution of the problem of the development of the nation. Faster, more dependable transportation; transportation upon a far larger scale was necessary. The problem in Baltimore had been made acute by the fact that the Erie Canal, then new, was taking trade away from the city. Because of this, a meeting of the prominent citizens was called at the home of George Brown. The next float visualized one of these meetings which was held in February, 1827, at which the bold project of a railroad was discussed and brought into actual being. In addition to Mr. Brown, Phillip E. Thomas, who was to become the first president of the new railroad, and other prominent Baltimoreans of that day were shown seated at the table.

Next the pageant reproduced the historic parade of July 4, 1828, to celebrate the laying of the first stone of the B & O railroad. The next floats in line showed the developments preceding the steam engine, the army engineers from West Point surveying the route in the early 30's, the military academy being the only school of engineering in the land from which to draw such talent in those days. Then came the first horse car which, in May of 1830, began its daily trips between Mount Clare, Baltimore, and Ellicott Mills. This was followed by the treadmill car on which the horse developed the power, a device soon abandoned according to a story still told, when it ran into a cow one day and was ditched. Another type of motor power still more impossible was then por-



The William Mason at Which We Are Now Looking, Folks, Was Built at Taunton, Mass., in 1856. First Engine With a Link Motion.

The Ross Wiman Was Developed in 1869, and Was Used in the Freight Service. It Was Commonly Known as a Camelback. It Had Boiler Pressure of 115 Lbs. Tractive Power 14,850 Lbs.

trayed, the sail car. At this point, according to the announcement coming through the amplifiers, we learn that the horse car was not the solution of the problem of motive power. Peter Cooper, a New York alderman, financially interested in the B & O, designed the Tom Thumb, the first American-built locomotive, to show what steam might do.

Now the early engines are coming—the first of the steam locomotives. The tiny Tom Thumb, which weighs two tons, leads the way. After that is the "York," which Phineas Davis, the York, Pa., watch maker, built and took down to Baltimore to win the prize of $4,000 offered by the company in 1831.

Third in line is the "Atlantic," built in 1832, which, miraculous to relate, actually stayed in the service for more than 60 years.

Out of the past comes the "Jefferson," which was the first locomotive in Virginia, being first employed in 1836.

Following this came the William Galloway, the first engine with a horizontal boiler, and the Mennon No. 57, built in 1848 for fast passenger service. A float shows the birth of the telegraph in 1844 with Morse sending the world's famous message "What Hath God Wrought" which was flashed along the wires of the B & O from the national capital at Washington to the railroad station in Baltimore.

Pony express riders and an early day western stage coach, indicating the first development of the express business, go by on the roadway, while on the railroad tracks above, the William Mason, built in 1856, and a large float showing Abraham Lincoln wearing his black shawl and tall top hat as he arrived in Washington over the B & O in time for his first inauguration.

Following this, comes the Thatcher Perkins in its bright colors pulling a passenger train, typical of the kind used in Civil War days. A float shows soldiers tearing up the B & O tracks during the Civil War, soldiers clad in field gray, their comrades holding rifles with shining bayonets as the raiders work destroying the road. Engines continue to pass by the grandstand, all operated under their own power, their whistles shrieking while the band plays on. The Ross Wiman Camelback, the J. C. Davis, the A. J. Cromwell, the first electric locomotive to be operated by a steam road in 1895; the 1310 with its 78-inch drivers, the John Muhlfeld, the first big Mallet ever built in this country—all greeted with applause.

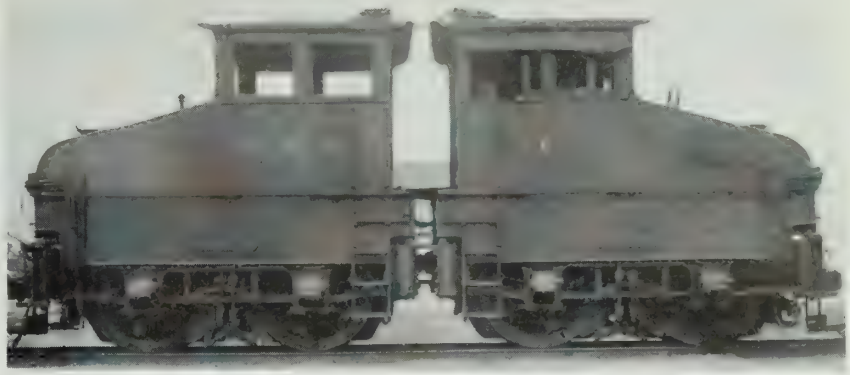
Here Is an Original Iron Box Car Built in 1863 for the Baltimore & Ohio. You Might Pack a Couple of These in a Modern Freight Car.

Now the hard working band strikes up "Rule Britannia," and visitors from far and near who have come to honor America's oldest railroad have their inning. A float bearing Britannia, herself the mother of the steam railroad, appears with Stephenson's famous Rocket. From the left, groomed to high polish and wreathed in light wisps of smoke, comes the British Empire's best, the King George V, with its simple lines. This fine lo-

When Shown at the Philadelphia Centennial in 1876 the J. C. Davis Was Said to be the Heaviest Passenger Engine in Existence.

comotive was described in Transportation in August. It carries no headlight or bell. Then the giant Confederation, weighing 324 tons, the property of the Canadian National Railway, and the Canadian Pacific's 2333, Pacific type passenger engine.

But this Fair of the Iron Horse had many sides. It was not strictly a B & O affair. The road's neighbors and competitors were there. Several of the railroads used large advertising space in the Baltimore daily papers to congratulate the B & O and the citizens of Baltimore. So now the pageant turned back to show what part these other roads had played in the development of the iron horse. The DeWitt Clinton, familiar to so many persons in this country, passed in review, chugging along with its train of little coaches with flanged wheels. The John Bull, imported from England in 1831; the Satilla, built by the Rogers Locomotive Works in 1860 and recently restored by Henry Ford. The Great Northern Railway was represented by the Wm. Crooks, built in Paterson, N. J., in 1861, and shipped by rail to La Crosse, Wisconsin, where it was loaded on a barge and transported along the Mississippi to St. Paul. This engine began operating in June, 1862, between St. Paul and St. Anthony, now Minneapolis, a distance of ten miles, pulling the same baggage car and coach that trailed along behind it in the early days.

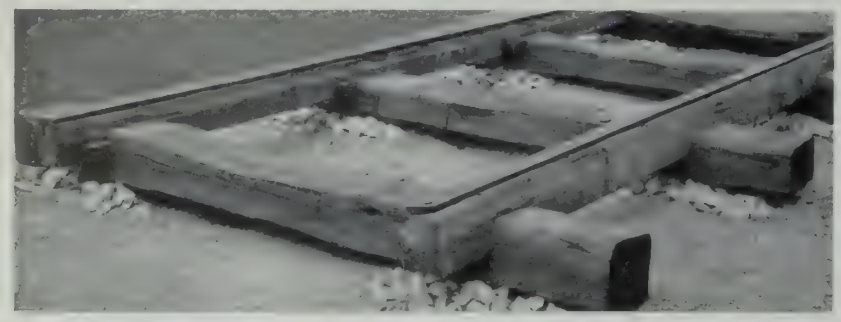


This, Ladies and Gentlemen, Is the First Electric Locomotive to Operate on a Steam Railroad. Built in 1895 for the B & O Belt Line Tunnel at Baltimore.

The years have passed by swiftly this afternoon, and we have arrived at the today of the iron horse, the most important in many respects of all days in the growth of transportation, the day when the great designers are exerting every energy to increase the power of locomotives. Limited in size by physical dimensions, weight, heighth for bridge and tunnel clearance, the effort is put forth to develop greater power, higher speed and fuel economy. Into this picture move the leviathans of today, the New York Central's new Hudson type, the Pennsylvania's 8800, the Delaware & Hudson's John B. Jervis, the Western Maryland's Decapod 1112, and all the newest types of engines developed by the B & O, concluding with the President Washington, the first locomotive of the new President class. Resplendent in its olive green it pulls six cars representative of the famous Capitol Limited. As the train comes to a stop before the stand, a porter immaculately groomed opens the doors, a noise is heard at the end of the stand and 40 persons with suitcases and baggage rush out and board the train. As the conductor's voice calls out the familiar words which travelers have come to accept as meaning "all aboard," the visitors again hear from Mr. Coburn requesting that everyone keep his seat as the Capitol Limited, after circling the grounds, will return to demonstrate one of the newest phases of transportation, the motor bus. The long, sleek, comfortable looking buses pull up in front of the grandstand, and as the limited train arrives, liveried attendants whisk the passengers and baggage quickly into the buses to be carried directly to their hotels.

A Tank Motor Truck, as Can Plainly be Seen, Used to Collect Milk at Receiving Stations Not on a Railroad Line, and for Similar Purposes.

The crowd rises to sing "America," the curious hedge their way along to the center box to congratulate Mr. Willard or catch a casual glimpse of Governor Ritchie; Herbert Hoover, secretary of commerce; Attorney General Sargent; Secretary of the Interior Work, and Mayor Broening, and other celebrities who have come to pay their respects to the nation's



Original Construction of the Main Tracks of the B & O Between Baltimore and Ellicott Mills. Note the Wood Stringers and Sleepers.

railroads. The visitor's mind turns to the men and women who have made this great show possible, the 500 employes of the B & O who had toiled unceasingly, loyally, and with little help from outside talent, courteous, eager and happy to make this the greatest birthday party in history.

In the Hall of Transportation were many fine valuable and interesting exhibits, showing the progress in all types of devices related to railroading. Startling contrasts between the old and new are brought out in strong relief. The vast improvement of the present pipe-conducted, vapor-heating system in coaches over the crude simplicity of the old wood-burning stoves; the advance in the lighting of cars from candles stuck in glass tubes to electricity; the development from the clumsy hand-brake to compressed air; the first sleeping-car, and the modern home-on-wheels. In short, most of the railroad inventions that the busy brain of man has been able to devise in the past 100 years are displayed.

In 1841 When Building the Main Line Track Between Harper's Ferry and Cumberland the Wood Stringer Was Used With a V-Rail Construction.

Against the south wall of the building is a model panorama, 250 feet in length, representing typical scenes along the Baltimore & Ohio from Baltimore to Chicago. The houses and general appearance of Baltimore Town were those of the period of 1830, while Chicago pictured the skyscrapers of today. Ten miniature working models of historic and modern engines, electrically driven and reproducing exactly the essential features of the originals, were spotted at various points along the scenic railway. Hauling coaches and freight cars built to scale, these engines travel over miniature bridges of widely different types, from the old covered wooden structures to the great concrete and steel spans of the present day.

On two big tracks in the center, running the entire length of the building, was a collection of 31 models and originals covering in brief the world history of steam driven appliances, from the grotesque inventions of Newton and Murdock, dating back to the Eighteenth Century, to the famous Director General, with six-foot wheels and a highest recorded speed of more than 90 miles an hour—the premier engine at the Chicago World's Fair of 1893. A special feature among these exhibits was a Ptolemy ox-cart from Egypt on the Nile, used 2100 years ago to carry animals for sacrifices to the gods.

The north side of the Hall of Transportation was devoted to historic displays of railway signaling devices; of stokers, showing the development from the time when engines were fired by hand to the efficient mechanical stokers of today; and of brakes, from the stout wooden blocks forced against the wheels by means of a horizontal lever, to the powerful air brakes in operation on modern engines. Some of the more complicated devices on display were sectioned, affording an opportunity for minute examination.

At the west end of this building was a scenic display showing historic Harper's Ferry and vicinity. The great feature of interest was an exact model of the original wooden bridge spanning the Potomac River where it joins the Shenandoah, built in 1838. This bridge was burned by Stonewall Jackson in 1861 when

But in 1830 Stone Sills Were Used in the Railroad Track. Compare This Construction With the Lines Now Spread All Over the Nation.

Oil Electric Motor Car With Six-Cylinder Diesel Engine Built by William Beardmore & Co., Ltd., of Glasgow for the Canadian National Rys.

he and the Confederate army evacuated Harper's Ferry. During the course of the Civil War, the bridge was destroyed nine times, four times by opposing armies and five times by floods.

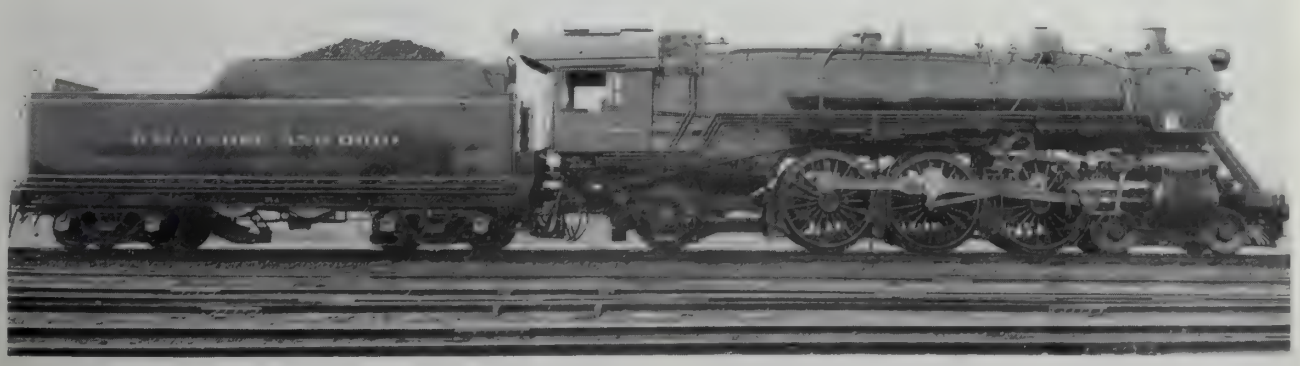
Arranged along the walls near the Harper's Ferry model was a historic collection of pictures illustrating in chronological order the evolution of the locomotive on the Baltimore & Ohio Railroad. Beginning with the ingenious four-wheeler sail-car invented by Evan Thomas, which ran on wooden stringers and strap rails, the pictures followed right on up the line of progress to the heavy Mountain type freight engines and the high speed passenger locomotives now in service.

A special section was set aside for the largest and finest historical collection of railroad timepieces in the United States. Over 200 railroad watches, local and foreign, and a score of clocks with interesting biographies, were shown. The Baltimore & Ohio was the first railroad in the country to establish a strictly supervised time service system, requiring the services of 137 certified watch inspectors. Under this system employes of the railroad must carry watches that will not vary more than 30 seconds a week.

In the Traffic Building, somewhat smaller than the Hall of Transportation but just as beautiful, were shown some of the cooperative activities of the railroad —the scientific location of industries, the development of geological resources and increasing the productivity of the soil by working with the farmers; "Safety First" and other kindred movements.

In the center was an elaborate model of the Locust Point grain elevator of the Baltimore & Ohio, one of the largest, most efficient and rapid grain handling plants in the world. Shipping of grain to vessels loading at eight berths over a gallery system of 2500 feet to the most distant berth, has been made at the rate of 150,000 bushels an hour, while the unloading of cars at the same time over the four automatic car dumpers has averaged eight minutes a car on each dumper, or a total of about 60,000 bushels of grain received every hour. The entire plant is operated by electricity.

By the north wall one found exhibits showing the agricultural and industrial development of the Baltimore & Ohio, displaying some of the literature used to help farmers and industries to do better and more business. Other spaces in the



And Now, Friends, We Present for Your Approval, the President Washington, the Latest Example of B & O Efficiency. George Ought to be Proud if He Hears About It.

building were devoted to the employes' magazine, freight and passenger department exhibits, including a detailed display of old and new tickets and time tables.

In this building also was an exhibit of unusual interest and importance, showing in an elaborate and attractive manner the facilities offered by the company to its employes to acquire homes and to secure other benefits through the relief department.

In the Allied Services Building were shown the principal associated services of railroads, including the telegraph, telephone, express, railway mail service, etc. The Western Union Telegraph Co. sent a display tracing the evolution of the telegraph from the crudest beginnings to the present. Among other interesting devices shown was the original instrument by which the inventor, Morse, transmitted the first telegraph message in America from Washington to Baltimore in 1844 over the wires along the Baltimore & Ohio's right-of-way. The American Telephone and Telegraph Co. contributed an exhibit demonstrating the important work of the train dispatcher, the "eyes of the railroad," who has control over every train running over the district assigned to him for surveillance. This display included a historic collection of telephones, showing the great advances made in this means of wire communication. The original switchboard used for the first time in the United States was seen in actual operation.

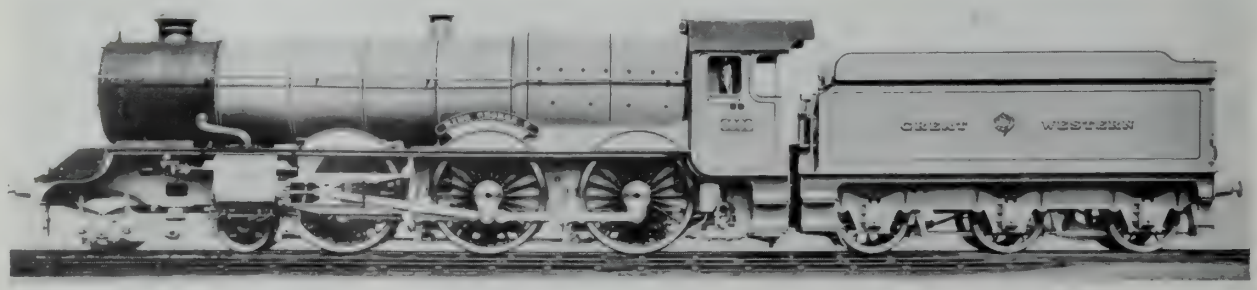
The federal postoffice department prepared an elaborate exhibit showing the close cooperation of the railroads in the rapid and efficient movement of the mails by rail. Another section displayed a reproduction of the steps in the growth of the express industry, sent in by the American Railway Express Co.

A number of the larger steamship companies cooperating with the railroad sent models of the most advanced types of ocean giants. Among these were the "Aquitania" of the Cunard Line; the "Greater Detroit" of the Detroit and Cleveland Steamship Co.; the "Majestic" of the International Mercantile Marine; the Luckenback, oil tank ship; the "Columbus" of the North German Lloyd lines; a model of Robert Fulton's first steamboat, the "Clermont", and of the "Hendrick Hudson", the last word in river steamboats from the Hudson River Day Line; the "Leviathan" of the United States Shipping Board and models from the Chesapeake Steamship Co., the Merchants and Miners Transportation Co. and the Baltimore Steam Packet Co.

Some of the stationary exhibits were spotted in various places outside the buildings. Included in these was an interesting exhibit by the Pullman Company. The original "No. 9," the first Pullman car, was placed alongside one of the luxurious modern entertainment cars, complete with facilities for dancing, moving picture shows, lectures, gymnastic exercises, a barber shop, shower baths and library. This first sleeping car is about 44 feet long with a flat roof, sash windows, candle lamps. The berths are braced by stanchions and raised and lowered by pulleys. There was no linen. A blanket and mattress and pillows constituted the bed equipment. Heat was provided by wood stoves. There were no porters. The conductor took up the tickets, and the brakeman made the beds. The first trip was run in September, 1859, from Bloomington to Chicago over the Alton.

Among exhibits of modern equipment was a combination coach, an agricultural demonstration train, a train-side motor bus, an individual seat car, and merchants dispatch refrigerator, fruit growers express refrigerator, oil tank, and milk tank cars. The milk tank car is a prototype of the modern glass lined car installed and operated six years ago by the Baltimore & Ohio. It is in effect two large thermos bottles of 3000 gallons capacity each, made of steel and glass lined, thoroughly insulated and equipped with various agitating, temperature - recording and regulating devices.

The development of track construction was symbolized by ten sections of rail, each representing a forward step in improved methods. This display included also labor saving devices used by repair men on the line, such as motor cars, hand cars, tools, etc.



King George V, the English Contribution of the Great Western Ry. to the B & O Centenary.

When Roadmasters Get Together

The Forty-fifth Annual Convention, at Buffalo, Largely Attended

By
Howard Kennedy

McKinley Monument and, in the background, the Hotel Statler, Buffalo, Where the Roadmasters Convened.

SPEAKING to the employes of the Baltimore & Ohio Railroad not long ago, President Willard, as quoted in this magazine last month, said:

"When we accept employment in any capacity, whether as president or track laborer, and I have been both, it is our moral duty to give good, efficient and loyal labor for what we receive."

If Mr. Willard could have sat through the sessions of the Roadmasters convention in the Fillmore room at the Hotel Statler, Buffalo, where the 45th annual convention of the association was at work September 20-22, he would have realized that here were roadmasters from all parts of the country who seemed to have realized the full moral responsibility of their jobs. The keen interest with which these men followed the reports of the committees, their evident willingness to discuss the subjects, to give their experiences and opinions, were the best kind of evidence to prove loyalty to the companies employing them, and the interest they take in their work. The questions in every man's mind seemed to be "what does it cost; can we find a better way to do this job or that; can we lower the expense and save money for our company?"

Economy does not need to be urged on this kind of roadmasters. What they need is encouragement in the work they are doing and more cooperation from other departments, especially of maintenance and operation. Examining the subjects handled by this convention, it is easy to see the excellent kind of work the Roadmasters Association is doing.

Committee reports were presented on "The Rearrangement of Track Work to Promote Uniform Forces Throughout the Year," E. E. Crowley, chairman, roadmaster, Delaware & Hudson; "The Track Department's Share in the Reduction of Stocks of Materials," W. A. Davidson, chairman, roadmaster, Union Pacific; "Means of Reducing Work Train Service," P. J. McAndrews, chairman, roadmaster, Chicago & North Western; "The Collection and Use of Cost Data by Supervisory Officers," C. H. R. Howe, chairman, cost engineer, Chesapeake & Ohio; "The Training of Trackmen as a Means of Preventing Accidents," G. H. Warfel, chairman, assistant to general manager, Union Pacific.

Papers and addresses were presented on "The Control of Track Material Stocks," by H. C. Pearce, director of purchases, Chesapeake & Ohio; "The Use and Abuse of Motor Cars," by C. R. Knowles, superintendent of water service, Illinois Central; "The Economics of Heavy Track Construction," by George J. Ray, chief engineer, Delaware, Lackawanna & Western Railway.

J. B. Kelly, president of the association, general roadmaster for the Minneapolis, St. Paul & Sault Ste Marie, presided efficiently throughout the convention.

The predominant subject for discussion among the little groups gathered in the lobby during the convention was the regret every member felt at the loss sustained by the association through the death, last July, of W. C. Kidd of

the Rampo-Ajax Corporation, who devoted much of his time and labored so energetically for so many years in the interest of the Roadmasters and the Track Supply Association. As a testimonial to his memory a large portrait of Mr. Kidd was hung above the presiding officer's chair, draped in flags. The picture is to be presented later to his family. The Roadmasters and Track Supply Association voted also to erect a bronze tablet in the cemetery to Mr. Kidd's memory, the expense to be borne jointly by the two organizations.

Officers elected for the ensuing year by the Roadmasters and Maintenance of Way Association were:

President, J. P. Davis, engineer maintenance of way, Central Indiana, Anderson, Indiana.

First vice president, H. R. Clark, general inspector of permanent way, C. B. & Q. Chicago.

Second vice president, E. E. Crowley, roadmaster Delaware & Hudson, Oneonta, New York.

Secretary, T. F. Donahoe, general supervisor of track Baltimore & Ohio, Pittsburgh.

Treasurer, James Sweeney, supervisor of track, Chicago & Eastern Illinois, Danville, Ill.

The bylaws of the association provide that the officers and executive committee shall select the place for holding the next convention, depending on their ability to make suitable arrangements. It provides also that the membership shall ballot as to the choice of location. The ballot taken during the closing session showed that Detroit had the most votes with Chicago as second choice.

The exhibit of the Track Supply Association was placed on the main floor of the Hotel Statler below the convention hall and opening from the main lobby. Fifty-six exhibitors had space. An extremely interesting display was shown of track tools, and maintenance equipment. A. H. Todd, general manager of the Positive Rail Anchor Co., was president, and J. Howard Horn, salesmanager of the National Lock Washer Co., vice president of the Supply Men's Association. Following the death of W. C. Kidd, who was secretary and treasurer, George Cooper of the Rampo-Ajax Corporation took over his duties.

About 500 persons attended the annual dinner given Wednesday evening by the Track Supply Association to the members of the Roadmasters Association at the Hotel Statler.

One of the important and extremely valuable reports submitted in the convention was that dealing with work train service. This report was presented by P. J. McAndrews, roadmaster, Chicago & North Western, as chairman; W. A. Clark, supervisor, Reading, vice chairman; A. Chinn, assistant engineer maintenance of way, C. B. & Q.; J. M. O'Connell, track supervisor, N. Y. N. H. & H.; G. F. Smart, general roadmaster, Great Northern; J. J. Desmond, roadmaster, Illinois Central; J. G. Hartley, division engineer, Pennsylvania; J. H. Dooling, assistant supervisor B & M; B. E. Haley, general roadmaster, Atlantic Coast Line. The report:

"Work train service has always been a major item in the cost of performing certain operations in track maintenance, the principal work involving work trains being rail replacements, tie renewals and ballasting. With the general trend toward higher compensation for train and engine crews which has prevailed for some years, and the punitive overtime rates now in effect, it is essentially a part of good management to study ways and means of reducing this expense. Work train crews are variously rated as costing from $8 to $12 an hour, an average rate of $10 an hour having been fixed by the operating departments of some railroads a number of years ago, and before later increases in wages and the much higher costs of fuel prevailed. Those having charge of the operation and maintenance of our railroads understand well that work train costs are actually much greater than the actual pay roll and fuel costs, and that delay to other traffic is an element of expense that adds greatly to the evident cost figures.

"We must not lose sight of the fact that with the increased weight of rail, and with more and heavier track material in general, with a constantly reiterated demand for the utmost efficiency in maintenance work, the following basic principles exist:

(A) Work trains are a necessity.
(B) Work trains being necessary, their efficient operation is essential.
(C) To secure efficiency the planning of work is of primary importance.

The planning of work for these trains should include the determination of the following points:

(A) Can we secure substitutes for work trains in certain operations?
(B) What machinery can be used most economically?
(C) How many men should be assigned to a work train?

"Other considerations include traffic density, class of power required, and in general the equipment best suited to work being undertaken.

"Regardless of many communications passed around periodically instructing trainmasters, train dispatchers and other operating officers to interest themselves in the economical operation of maintenance work trains, it is usually found that the roadmasters and supervisors are the ones who are held responsible for such operations, and when they are not energetic and resourceful, operations are often unsatisfactory.

"Naturally the roadmaster who can accomplish the desired results with the minimum service, is looked upon with favor, this, coupled with the satisfaction derived from knowing that a job is well done, being an incentive to those in charge to put forth their best efforts. As a result, we find roadmasters and supervisors usually spending a considerable portion of their time with their work trains. Cooperation of the operating department, especially of train dispatchers with the roadmaster or other officer in charge to secure the maximum service from work trains, with the minimum delay to

The New, $4,500,000 Peace Bridge Over the Niagara River, Connecting Buffalo and Fort Erie, Ontario.

other trains is essential to satisfactory results.

"It has become the rule with most railroads to prepare budgets covering rail renewals, ballasting, track extensions, etc., and it is therefore known some time in advance about what will be required in the way of work train service during a season. With such information at hand consideration should be given to the questions outlined, viz:

"Can any substitutes be used for work trains? Such substitutes may consist of motor car and trailer equipment or self-propelled steam or gasoline units, such as ditchers, locomotive cranes, rail laying cranes, etc.

"When work trains are necessary, what machinery may be used in connection therewith to the best advantage? This equipment includes such units as ditchers, bank wideners, ballast unloading plows, rail cranes, etc.

"During what season of the year are traffic conditions most favorable for economical work train operation? In considering the advantages of doing work in certain seasons of light traffic, it is important that there be close cooperation between the executives in the maintenance, purchasing and operating departments to the end that material is provided, delivered and distributed at the time of least interference with traffic, and when it may be handled with the least possible chance of interfering with the handling of revenue business.

"Some supervising officers have adopted a plan of tie distribution by which ties are delivered at stations nearest to the points where they are to be used, and unloaded into piles, from which they are later distributed by motor cars and trailers and placed exactly where required on the line. Where it is deemed impracticable to so handle ties, and instead to distribute them by the use of work trains or by local freights, the ties should be delivered at the time of lightest traffic on the division. They should be loaded in cars best suited for quick and safe handling, it being expensive to unload ties from box or stock cars. They should be delivered in quantities that will enable a roadmaster to use the most economical number of men to unload them, thus lowering the cost, and by getting the work train off the line, avoid delay to other traffic.

"Savings have been made in the handling of rail with a locomotive crane and pilot conductor, in place of a work train where conditions are favorable. This can be done to advantage where the distance between side tracks is not too great and trains not too frequent. To handle this work economically, large and powerful cranes are required, the suggested type having a draw bar pull of 10,000 lb. and a traveling speed of 15 to 20 miles an hour. With machines of this type, the cost of handling rail can be cut in half. One or two cars of rail can be taken out and unloaded or loaded at a time. The great trouble with the average locomotive crane is that it is too small and too slow, and cannot be operated under its own power any distance from side tracks. Any road considering the purchase of cranes should bear this in mind for with equipment of this character it is possible to reduce work train service to a minimum in the handling of rail for relaying.

"Another successful practice in unloading rail for renewals consists of using two small rail cranes in the same train, it having been found possible to get very good results from such a practice.

"There are a number of rail machines on the market that are reported as highly successful in handling the longer and heavier rails now coming into general use, the use of this modern machinery tending to reduce work train service by doing more rapidly such operations as unloading new and loading old rail.

"It is of the utmost importance that rails for distribution on the line be loaded in equipment suitable for rapid handling by work train and unloading equipment, a further consideration being to avoid unnecessary hauling of cars for rail loading. While the use of flat cars may be preferred, rails

can be handled from gondolas rapidly when suitable rail-handling cranes are available. The advantage of flat cars consists chiefly in the possibility of transferring the rail cranes from car to car while the work train is out on the line, thus avoiding delay incident to going into a station and making a switch.

"Through sections of the prairie states, where the country is not too rough and fills do not exceed 20 feet in height, considerable savings have been made by widening weak and narrow banks and raising the sub-grade with a drag line, mounted on caterpillar treads. One railroad reports that 14 miles of roadbed were strengthened in this manner during the past season and that it plans on strengthening 35 additional miles of banks this year. The operation consists of moving a caterpillar-mounted drag line along the right of way and transferring the material needed from near the fence to the fills to build them up to the required standard. All borrow pits are required to be not less than 18 feet from the base of fill. Very satisfactory and economical results have been obtained in this manner. The advantages are: (1) A reduction in cost per yard of from 35 cents to 45 cents by work train to 20 cents to 25 cents per yard when handled by a drag line; (2) This method does not foul the ballast as where air dump or plow cars are used; (3) No waste or surplus material is handled, the proper amount being placed as the machine works along the track; (4) Bank widening can be done at the same time other track work is in progress, which is not possible where train haul is resorted to. The machine used is driven by a gas engine and requires a crew of one operator and two laborers. It handles from 400 to 500 cu. yd. a day.

"Ditching with locomotive type ditchers reduces work train service by eliminating the locomotive with these machines. A number of roads have used them with satisfactory results, each machine handling two air dump cars and a spreader. Where extensive ditching is being done on main tracks one engine can handle two ditching machines and reports have been received indicating that it is a very economical practice to have one self-propelled ditcher handle an outfit of cars and another ditcher, thus eliminating the locomotive and its crew.

"These machines have a traveling speed of 15 miles an hour, and are operated on main and branch lines without locomotive or engine crew. On main lines where traffic is heavy a conductor and two brakemen are employed and on branch lines a conductor and one brakeman. A saving of from 12 cents to 25 cents a yard has been made with this type of machine.

"A reduction in work train service can be made by the use of a ditching and bank widening machine with wings specially shaped to conform to the standard ditch and embankment roadway section of the road, this machine being capable of covering a considerable mileage a day. Through its ability to move earth out of cuts it makes unnecessary such operations as loading material on cars, which involve a considerably greater expense than when the material is handled by the ditching spreader. Substantial economy has been shown by this method of opening and cleaning ditches, which work is a most essential part of track maintenance.

"One road reports that in the last three years it has used the following system in loading pit-run gravel, thereby eliminating one entire train and engine crew, and has shown a saving of from 5 cents to 12 cents a yard of material handled. Six of its pits are now being handled in this manner: A caterpillar-mounted shovel of the full-circle type is used, of the largest size it is possible to transport on a flat car. These shovels weigh 50 or 60 tons and are provided with 1½-yd. dippers. The pit or loading track is kept at a sufficient distance from the top of the bank to permit the shovel to operate between it and the track, and a sufficient number of cars, according to the capacity of shovel, are spotted at night or early in the morning to keep the shovel working all day. The shovel loads from 40 to 50 cars, 30 yards a car. It loads each car and then moves to the next, continuing until the entire train is loaded. This eliminates the spotting crew which is used with the railroad type shovel. The capacity of a shovel of this type is not as large as of the railroad type, but the cost per yard is what tells the story, and as stated, from 5 cents to 12 cents a yard is saved in loading gravel in this manner.

"The following practices have been reported by various railroads as means of reducing work train service:

"On two divisions two motor buses have recently been put in service to transport extra gangs to and from work, on the highway, the buses handling both men and tools. Where the highways are good and parallel the tracks, this is a much quicker means of transportation than motor cars.

"A universal crane is also being used, mounted on a five-ton truck, handling supplies in a material yard, operating a clam shell to load and unload material and to handle stock pile and steam shovel pit tracks in sections or panels, in place of lining them over with bars. Many uses have been found for this machine which eliminate work train service.

"Of 20 roads reporting, 15 state that motor cars and trailers are used to handle ties and track fastenings from stations to points of work out on the line. Two roads report that no economy has been effected while several others report from 25 to 40 per cent savings as compared with work train service, with the added explanation that when distributing fastenings for rail laying jobs, kegs are not broken in handling and the mate-

rial is placed more nearly where wanted.

"Heavy duty motor cars and trailers are in general use for hauling extra gangs.

"Several roads report the use of motor trucks to handle material from storehouses to jobs in terminals, one report indicating that material has been hauled as far as 43 miles from headquarters and work done in one day that otherwise would of necessity have been deferred for at least one more day.

"Work train service may be reduced in ballasting operations through the use of modern ballast cars which may be dumped from either center or side or both. Careful distribution of ballast will render it unnecessary to use follow-up trains to pick up surplus ballast to any considerable extent.

"One road reports as follows: 'For the past four or five years we have unloaded 75 per cent of the stone, gravel and cinder ballast on this district by local freight, unloading as many as 200 to 250 cars of ballast in this manner during the season. The material is handled in center dump cars. By having a gang of three or four experienced men go out on a motor car and meet the local freight, we have unloaded as many as 12 cars of material in 50 minutes. The cost of unloading stone in this manner was as low as 2 cents a yard, while the cost of unloading cinders and gravel averaged about six cents a yard, as these materials do not run from cars as freely as stone.'

"In general the reports received indicate that modern ballast cars are a potent means of reducing work train service in all ballasting operations, and while these modern cars are apparently used on many roads we believe their use may be extended and that the obsolete cars sometimes assigned to ballasting operations, especially when handling cinders, should be eliminated from such service.

"One road reports that the use of a motor truck for handling materials from the storehouse to various parts of a terminal not only reduces work train service, but tends greatly to reduce the stock of materials which otherwise would be distributed throughout the yard for possible emergencies, the fact that prompt delivery is assured enabling the supervisor to reduce his working stock of track materials very much.

"Another road reports: 'We have used a self-propelled gasoline crane in handling men and materials on such work as relaying rail, and on construction jobs. We have recently completed a job where 90 per cent of the material was handled by a gasoline-driven crane, which material otherwise would have been handled by a work train at much greater expense.'

"A gasoline-driven crane has been used to handle a flat car with material for a switch relaying job from the material yard to the place of insertion in the terminal, and after laying it the crane picked up the old material and returned it to the material yard and unloaded it.

"Modern crawler-type gas or Diesel shovels for excavating, stripping and gravel pit work, owing to their mobility and freedom from water and fuel problems, require much less work train attendance and often all that is required is the switching out of loads and replacement with empties.

CONCLUSIONS

1. The roadmaster or supervisor who is responsible for work being done should have full charge of all track maintenance work trains.

2. A first class foreman and a suitable force of men should be assigned to work trains, the crew to be regularly employed on such work when conditions permit. When a work train is required for any considerable length of time, a foreman should be assigned and rates of pay for foreman and laborers should be higher than those paid for other regular work, as this will make the work attractive and will result in economy.

3. The daily assignment of crews on work trains should be in conformity with the present practice of most roads and crews should only work such hours as will enable track gangs and the work train gang itself to be used economically.

4. Work trains should not be used in terminal yards, as such work can be handled more economically by self propelled steam or gasoline cranes.

5. Each operation involving the possible use of work trains should be given careful consideration, as it may be found that some plan will be found practicable whereby the use of a work train may be partially or entirely avoided.

6. As the cooperation of the maintenance and operating departments is essential to economy in maintenance work, it is of the most importance that detailed study be made of work where trains may be required, and expedients, such as setting back dead freight trains, diverting trains to another track, etc., adopted to avoid the delays usually incidental to work train operation. The providing of proper equipment must of necessity include a suitable locomotive of proper capacity and in first class condition so that no delays will result from lack of power.

7. Where consistent with current agreements covering the assignment of train and engine crews to work trains, we believe that men who are known to be best fitted for such work should be assigned.

8. The work should be programmed and studied so that no unnecessary work train service will be used. When work trains are in service see that they are utilized to obtain maximum results, and that as many jobs as possible will be done on one trip, avoiding repeated trips over the same job. Impress every employe having to do with work trains with the necessity for curtailment of costs which must be brought about through increased efficiency. This means study, organization, supervision.

Largest Storage Battery Locomotive

The largest storage battery locomotive in the world, weighing 110 tons and capable of hauling a 1,500-ton train, has just been purchased by the State Line Generating Co. for service in its yards at Hammond, Ind. This locomotive, built by the General Electric and Electric Storage Battery Companies, has all the advantages of an electric locomotive but does not require an overhead trolley or third rail for its power. It is noiseless in operation, and can accelerate quicker and move a heavy load much faster than other types of switching locomotives. Its huge storage battery, weighing 39 tons, the largest ever manufactured for this purpose, will deliver 1,000 horsepower to the driving motors. This power is equivalent to 1,579 six-volt batteries such as used for radio purposes, or is sufficient to crank 1,600 automobiles simultaneously.

What the Papers Say

WHY it takes so long for news to come out of the heart of China (recently two months elapsed between the time the seismograph recorded an earthquake "somewhere in Central Asia," and the time the world got the story of its havoc in Western China) becomes clear upon examination of China's railroad map.

This vast country, one-third greater in area than the United States, with more than twice the inhabitants of the two Americas combined, has less railway mileage than Kansas. The United States has one mile of railway for every 12 square miles of territory and for every 460 of its population; China has one mile for every 550 square miles of territory and for every 56,000 of its population.

Scarcely more than one in five Chinese has even seen a railroad and scarcely more than one in 50 has even ridden on a train. The Province of Szechuen, twice the size of Illinois and containing as many people as the United States east of the Mississippi River, has no railway at all, nor have Mongolia, Thibet and the provinces of Kansu, Shansi, Kweichow and Kwangsi. The total equipment of all Chinese railroads amounts to less than half that of one of the major lines in this country, and their equipment is generally so deteriorated as not to compare with America's.—New York Times.

Politeness Above All Else

Our sympathies are entirely with the railroads in a recent damage suit in Wichita, when a 13-year-old girl was awarded judgment of $150 against the Missouri Pacific R. R. for a bump on her forehead caused by a switchman, riding the pilot of an engine, kicking her off the track to save her life.

This should be a lesson to switchmen whose engines are about to run over little girls to preface their assistance with the polite inquiry, "Little girl, I've not had the pleasure of a formal introduction, but the train is now within a few inches of your feet; may we waive ceremony for a few minutes while I gently lift you from the track and deposit you in the safety zone?"—El Dorado (Kan.) Times.

Pleasures Overlooked

We ride in trains that provide the accommodations of an exclusive club, but if we rode alone we would have to rough it in the flivver in much the same discomfort as our fathers experienced. When we stop at a hotel in any city, large or small, we find in its lobby and its dining rooms and in our own temporary room the same luxury of service and convenience of modernity that only the millionaire can afford in his home. And when we send our children to school we place them under the direction of the skilled specialists and give them expensive equipment to work with that can be provided for the poorest child only because of the massed power of all our tax dollars.—Omaha World-Herald.

Prosperity for Both

In no other land is there the equal of the American railway system, which is so large a factor in the industrial and commercial activities of the country. Hundreds of thousands are employed in railway operation and many more are employed in industries which depend largely on the roads for business. The wages paid directly and indirectly by the roads contribute largely to the country's prosperity. — Youngstown (O.) Vindicator.

A Fair Return

Railroads are entitled to fair earnings on fair capitalizations. They are entitled to such liberal control restrictions, by federal and state utility commissions, to permit them to expand and to grow in usefulness. A community served only by a brokendown, rattletrap carrier soon reflects the condition of the carrier or vice versa. Railroads that prosper help the territory traversed to prosper.—Atlanta Constitution.

Grade Crossing Fatalities Decrease

Reports filed by the railroads with the Interstate Commerce Commission show that 668 persons lost their lives in grade crossing accidents in the first four months of 1927. This is a decrease of three compared with the total fatalities for the corresponding period in 1926.

Two thousand persons were injured in grade crossing accidents in the four-month period this year compared with 2,062 in the first four months last year.

Reports showed 1,746 highway grade crossing accidents took place from January 1 until May 1, this year, compared with 1,761 for the same period last year or a decrease of 15 accidents.

Of 4,000,000 people in Angola, West Africa, fewer than 50,000 are white, and there are only 700 passenger automobiles in the country.

You can take a day off, but you can't put it back.

The Engineers Had A Hot Time

Chicago Convention Sweltered

By W. H. Harper

THE only thing the committee failed to arrange in planning the annual convention of the Traveling Engineers' Association at Chicago this year was the weather. Hot! The mercury simply could not be persuaded to keep down out of the 90's, and all Chicago sweltered and said things. After a walk through the exhibits of the Railway Equipment Manufacturers' Association which, by the way, were larger, finer and more interesting than ever, one was ready for the shower and a complete change of raiment. In order to reduce laundry bills and make the meetings pleasanter in the future, the convention voted to change the date for next year's gathering from September, the usual month, to the first Tuesday in October. The meeting will be held at the Sherman hotel, however, in the future as in the past, or at least until further notice. J. B. Hurley, general road foreman of engines and fuel supervisor of the Wabash Railway, president of the association this year, presided over the deliberations. Nearly 400 members and guests attended the meetings.

J. E. Taussig, president of the Wabash Railway, addressed the convention Tuesday morning, praising the work of the Traveling Engineers, and pointed out how, by living up to the motto, "To improve the locomotive engine service of American railroads," the engineers can help the railroads in their efforts to create favorable public sentiment. After all, Mr. Taussig said, probably the greatest asset in accomplishing this is economical and efficient operation.

Mr. Taussig said there has been

President Powell, C. & E. I. Ry.

a change among the railroad men themselves; they have learned to see through the public eye, anticipate the needs of the public, and provide better service. It is understood now, he said, that the success of the railroads lies in placing their cards on the table, taking the public into their confidence, and giving full publicity to railroad problems and accomplishments. That this is a fact he said, is shown by the almost complete absence of adverse press comments. He called attention to the importance of reliable service by saying that one locomotive failure may do more harm than can be overcome by thousands of dollars worth of publicity work. Proper handling of air brakes at stations, water tanks and other stops, Mr. Taussig said, are important in order to prevent damage to lading and equipment in freight train service, and objectionable discomfort to passengers in their service. Mr. Taussig appealed to the Traveling Engineers to use their best judgment in training engine crews, in teaching loyalty to the roads, and in encouraging these new men to seek still better standards of locomotive performance.

R. H. Aishton, president of the American Railway Association, spoke informally, but nevertheless, made a strong appeal. Many who had heard him speak before, said afterward that this talk had appealed to them more than anything they had heard him say in years.

Mr. Aishton suggested the association appoint a contact committee to work with the A. R. A. on the use, construction and design of locomotives. The association appointed the following committee of seven for this purpose:

J. N. Clark, Southern Pacific, chairman; B. J. Feeny, Illinois Central; J. P. Stewart, Missouri Pacific; J. B. Hurley, Wabash; A. N. Boyd, Canadian National; W. A. Pownall, Wabash, and W. O. Thompson, New York Central.

The committee met Friday afternoon after the adjournment of the convention. Following his talk, Mr. Aishton was enthusiastically elected an honorary member of the association.

T. C. Powell, president of the Chicago & Eastern Illinois, spoke of the problems of railway management. The actual record with which the management is concerned, Mr. Powell said, is not the daily fluctuations in passenger and freight receipts, but the record made in the entire 12 months, shown in the annual report to the stockholders, the bondholders and the public. The principal burden of management, he said, is to secure traffic and provide facilities for handling traffic in proportion

to its volume but without wasteful expenditures for an excessive amount of equipment.

Mr. Powell explained the president's duty is to assist other officers in performing their duties to the benefit of the company and its owners. The president, he said, is just as much concerned about the economical operation of locomotives as he is with respect to the securing of traffic, the maintenance of the railroad, the payment of bills, or any other item.

He spoke of the way machinery has replaced man power in recent years, and said that while some inventions affect the railroads adversely, they return to them a certain amount of business not otherwise available. "The products of the farm," said Mr. Powell, "provide about 14 or 15 per cent of the tonnage of the railroads as a whole, but a very valuable part of this traffic would not be available for transportation had it not been for the discovery of refrigeration some years ago.

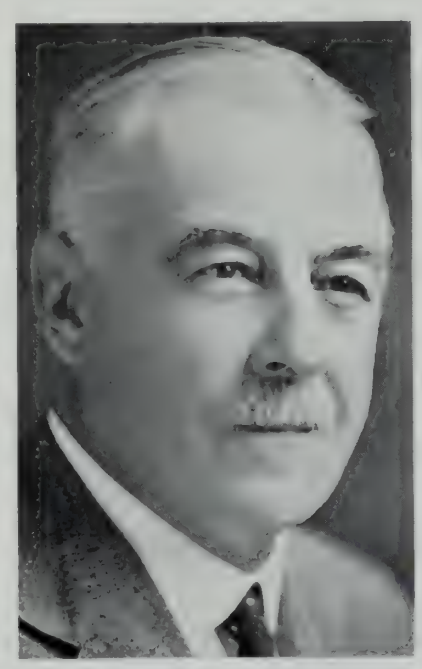
"The invention of the gasoline engine has created an enormous tonnage of gasoline which is handled from the refineries to the distributing stations sometimes by tank wagons, but more largely in tank cars over the railroads. Without this invention, the gasoline would be a drug on the market or would remain in the earth as not being valuable enough to take out.

"Lumber has always been an important traffic for the railroads, but lumber is being cut out, and the force of necessity is bringing out substitutes, and waste materials that would otherwise have been destroyed are now being converted into these substitutes, furnishing also a substitute traffic for the railroads, to take the place of the lumber.

"The invention of the talking machine has built up a large business in the construction of the machines themselves and particularly in the manufacturing of cabinets and records. The mere record itself involves the manufacture of wood flour in combination with other ingredients, all of which must be transported, mostly by rail.

"The radio has superseded the talking machine in a great many homes, and new as the radio is, it has already produced a volume of business which is surprising. Batteries, for instance, move in car loads, and the construction of cabinets, similar to those used in the case of the talking machine, also constitute a valuable tonnage.

"The airplane is regarded as a competitor of the railroad, and yet the airplane itself creates traffic through its requirements for air ports, construction plants, repair plants, gasoline stores and miscellaneous supplies. It takes from 1,000 to 1,500 carloads of material to fit up a flying field properly, and none of this would move unless the flying machine was a reality.



R. H. Aishton.

"Lamp black, a few years ago, was prepared only in small quantities for making paint, but now carbon black, which is almost the same thing, moves in train loads to be used in the manufacture of rubber tires. As a matter of fact, without carbon black, the present rubber tire would not be possible.

"I know you do not expect me to leave out the automobile, which has created such a change in the life, not only of the American public, but in foreign countries as well. The automotive vehicle transports a large amount of its own fuel, but in order that the vehicle itself may be put into operation, it is necessary to transport aluminum, steel, copper, lumber, rubber, leather or the substitute for leather, and a number of other items with which you are familiar."

Mr. Powell then explained that without invention the country itself would not only be much poorer, but in many cases would do away with traffic for the railroads. Traffic according to Mr. Powell is in a constant state of flux and "the operation of a railroad, therefore, is not simply one of maintaining the physical freight and passenger train service, but it depends for its very life upon first securing a sufficient volume of freight and passengers, and then in handling it in an economical and safe way."

J. M. Nicholson, fuel conservation engineer of the Santa Fe read a committee report on "more and better utilization of locomotives." This report pointed out the roads are giving considerable study and attention to effecting a better ratio of locomotive maintenance cost to revenue income as well as trying to obtain a maximum return from investments in locomotives and terminals. Utilization of locomotives, the report said, is so important that the American Railway Association has a committee of three operating and three mechanical officers who have been studying the operations and methods of different railroads in utilizing power. From statistics supplied by this committee, Mr. Nicholson's committee prepared three charts which show the improvement between 1923 and 1927 in gross ton miles per freight train hour and miles per active freight locomotive per day, and in miles per active passenger locomotive

per day. The report shows that while locomotives formerly were idle about two-thirds of the time, many roads now are making from 11,000 to 12,000 miles a month with active passenger engines, and 5,000 to 6,000 miles from active freight engines by reducing the non-productive time to a minimum and extending the length of the locomotive run. The report stated that to obtain more and better utilization of locomotives, it is important that terminals have adequate machinery facilities, enginehouses of sufficient capacity and properly equipped with necessary drop pits, washout plants, blowers systems, heat and light, adequate fuel, sand and cinder handling facilities, and that it should be borne in mind that the character of business, type and size of power, terminal facilities, the location of terminals, schedule of trains, quality of boiler feed water, quality of fuel, and profile of road are important factors varying on different divisions and on different railroads, and have a bearing on the utilization to be obtained. The committee suggested that frequent exchange of information as to power that will be ready and trains to be run is important and that close cooperation between the enginehouse foreman and transportation department representatives is necessary efficiently to maintain power with the minimum of delay. Greater utilization of locomotives can be obtained if enginehouse foremen know certain locomotives in their terminals will not be used for 12 to 15 hours. This time will enable them to make repairs during the layover which otherwise would require holding the locomotives out of service on the next trip.

Regarding the long locomotive runs the report says any change in the established runs must be supervised properly to insure successful operation because if the enginemen are not educated properly and instructed in right handling under these changed conditions the long runs will not effect the desired economies. That on long runs a uniform grade of fuel is important and that greater lubricator capacities for valve and cylinder lubrication and large capacity grease cups for crank pin lubrication are necessary, was insisted upon.

It was pointed out also that more and better utilization of yard switch power is deserving of study to determine whether the greatest amount of service is being obtained from locomotives.

J. N. Clark, Chief Fuel Supervisor, Southern Pacific Co.

In discussing this report, D. L. Forsythe, general road foreman of equipment, and Robert Collett, fuel supervisor of the St. Louis-San Francisco Ry., spoke of the long locomotive runs made by their engine 4100, described in the September issue of Transportation, and replied to questions about those runs.

A. T. Pfeifer, as chairman of the committee read a report on the "value of back pressure gauges and limited cut-off." The report was a resume of information obtained by sending out a questionnaire to several railroads. It brought out considerable diversity of opinion on the subject. The question as to results to be expected or derived from the use of back pressure gauges brought out the following, that it enables the engineman to work the engine to advantage, gives the road foreman better opportunity to demonstrate to the engineman how to handle the engine to obtain the best results and develops fuel and water economy. The committee report regarding the limited cut-off says:

"The use of limited cut-off entails no radical changes in the design of the locomotive. The principal change is the cutting of two slots known as auxiliary ports in the valve bushings. Its use results in economy of fuel and water with small sacrifice of starting effort and acceleration. In expansion ratio the limited cut-off locomotive approaches the compound engine in uniformity of torque, it is almost as good as the three cylinder engine and with this it combines the simplicity of the ordinary two cylinder engine. Maintenance costs should be no greater."

At the closing session, J. P. Stewart, general supervisor of air brakes, Missouri Pacific, and J. N. Clark, general supervisor, Southern Pacific, were elected members of the executive committee. The new officers are:

President, J. D. Heyburn, master mechanic, Frisco; vice presidents, James Fahey, traveling engineer, N. C. & St. Louis; Ralph Hammond, road foreman of engines, New Haven; A. N. Boyd, road foreman of engines, Canadian Pacific; H. B. Kelly, general road foreman of engines, P. & L. E.; J. M. Nicholson, fuel conservation engineer, Santa Fe; treasurer, David Meadows, assistant master mechanic, Michigan Central.

Age gives some people wisdom, others a grouch.

Some folks imagine that when they go away they leave a great vacancy, but in most cases they take it away with them.

The C. H. & D., Has Just Put Into Service a Number of the Cars Shown Here, Thus Proving the Optimism of the Managers of This Electric Line. Double End, Passenger and Smoking Compartment.

Optimistic, Hopeful C. H. & D.

The Cincinnati, Hamilton & Dayton Ry. Co., formerly in the hands of receivers, but taken over about a year ago by the Thomas Conway, Jr. Corpn., is completing a $2,000,000 rehabilitation program. This included a change from generated to purchased power and from 25 to 60 cycles; eight new automatic substations; improvements to the track and roadbed; new passenger rolling stock, and greatly increased facilities for freight handling. A public relations department has been organized and a house organ or magazine will be published.

Through service between Cincinnati and Dayton will be supplied with ten new interurban cars built by the Kuhlman Car Co. of Cleveland. Passenger comfort and pleasing appearance were considered in designing these cars. They have long, pleasing lines, are painted Pullman red, while a dasher fitted with lamps at the front of the single end cars serves still further to give an air of distinction. The most modern steel construction has been used throughout, promoting the safety of the passengers especially at high speeds. Brill No. 77-E-2 trucks have been used, assuring the utmost in comfort. The interiors are trimmed with mahogany. Center dome lights, cream ceilings and large windows contribute to passenger comfort. The seats are luxurious, upholstered in leather and fitted with foot and arm rests. A rubber tile floor covering of pleasing design enhances the appearance of the interior. Lights have been placed to illuminate the steps and

One of the Finely Upholstered Cars Just Built for the Cincinnati, Hamilton & Dayton.

roadway for passengers getting on or off.

Westinghouse multiple-unit HL control and Tomlinson automatic electric couplers permit train operation, and constitute an efficient means of caring for fluctuating passenger loads. All the cars are alike electrically, being supplied with Westinghouse type 535 (60 h.p.) field control motors and double end HL control. Seven of the bodies are fitted with passenger, smoking and baggage compartments and will be operated normally from one end; the remaining three have passenger and smoking compartments only and will be operated from either end. The single end cars must be operated at the head of the train due to the fact that they have couplers at the rear only.

Someone says Henry Ford is now selling only one-third the country's automobiles instead of one-half as formerly. But all Henry has to do to increase his sales at any time is change the radiator or advertise a spring has been added. Not long ago a California man traded in his Ford for a set of Dickens.

Each of the tracks in the Cheyenne yard has either a name or a number. Near the ice house is the "Dutchman" track. It is designated by placing the hands together and running them from the neck forward and downward, in the motion of an extremely fat man running his hands down over his bulky chest and abdomen. It was named after a former yardmaster named Umshler, who was a Dutchman.

Here Is Another Example of the Cincinnati, Hamilton & Dayton's New Equipment Just Put Into Commission. Single End, Smoking and Baggage and Passenger Car.

The Ways of John Long and His Men

The Union Pacific Shops

By Charles Dillon

YOU GO to the Union Pacific shops at Los Angeles intending to write about them. You are going to tell how they are laid out, how the work is done in the many departments, how much money is saved here and there through reclamation or intelligent foresight. You trudge along behind your guide for hundreds of miles, nimbly sidestepping the moving overhead cranes, and other things that seem to threaten disaster to the man who doesn't belong there, and you try to forget old superstitions as you duck under ladders and scaffolding where things are being built. You leap out of the pathway of busy little delivery motors. You exclaim delightedly over the flowerbeds and the trees, the palms, and the gravel walks. "My goodness," you cry, with surprise, "there are signs on the buildings telling visitors what's to be seen inside; isn't that queer!" "Oh," says the guide, modestly, "plenty of railroads have signs like those." "Maybe so," you reply, "but many do not, should anyone ask you."

John Foster Long.

All this time the guide has been telling you things you certainly must remember, but you don't like to show a notebook because sometimes that makes perfectly normal guides shut up like oysters, and you've been trying to impress this one with the belief that you understand everything clearly, which any guide on earth ought to know is the worst kind of hooey, considering the hundreds of men all around you who have given their lives to understanding the same things, and still fall short in some cases.

And then, about the time your stock of adjectives has been sunk, you go back to the administration building from which you started, months ago, it seems, and falling

into an easy chair in the chief's office, you realize quite suddenly that this isn't going to be a story about the shops after all—not entirely. It's about the man in charge.

John Fosten Long is his name. He has a rather imposing title: Superintendent of Motive Power and Machinery, but you forget all about this when you hear him talk. Perhaps you have been in many other railroad shops in your time, and have studied the men in charge. You may have been in some pretty large plants—much larger than these Union Pacific shops—and efficiency has become a commonplace word. You have seen on other railroads many of the time-saving devices found here. Athletic clubs, apprentice schools, organizations of one kind or another to encourage employes may have become casual things in your life.

Main Entrance, Locomotive Repair Shops, Union Pacific Ry.

But you can't spend a day in John Long's jurisdiction, you can't listen to the talk of a clerk or a mechanic or carpenter—if you can get one to stop what he's doing long enough to say a few words—without realizing that here, for a certainty, is something distinctly different. The effects obtained are sufficiently remarkable to convince you that the old law applies here, as everywhere, that under all effects there must be causes. No great movement, no important campaign for human betterment, no army ever achieved success without a leader, and that leader must have so conducted himself that his men believed in him, in his sincerity of purpose; for the average workman, be it understood, knows instantly the difference between genuineness of purpose and buncombe. What Lincoln said about fooling the people is just as true today in railroad shops as it was in Civil War days. No master mechanic or superintendent of motive power, and no president, for that matter, can sell himself to his men—to use a merchandising term—unless his Gospel of the Square Deal is the real thing. And the man who preaches this gospel would never get a hearing if he stood upon a pedestal and tried to be "It," shutting himself away behind closed doors with "Private" on the frosted glass. There are no such signs on the doors in these shops. Every man out there knows that John Long is superintendent, and doesn't have to be told about it. He knows about it because his knowledge and experience, extremely valuable assets to this railroad, have been called into conference whenever something really big was to be done. He knows, too, that Colonel Lindbergh did not originate the "We" idea, because he hears men everywhere about him using the word when they talk about the work. If you've had much experience in handling men or in studying them you know that wherever these possessive plural pronouns are used the workers have real interest in their jobs. It is, indeed, about the only form of selfishness to be highly commended, and belongs in the same category with the Golden Rule and Self Preservation. They're all to be found in John Long's shops.

There aren't any soreheads, either, or firebrands of discontent. These men even know how to shake hands, and if you have ever held fingers that made you think of a dead fish you'll appreciate the human impulse behind this one very important trait.

And another thing. Did you ever visit shops where some of the men looked at you when you entered, nudged the nearest man, whispered something, and then snickered? You knew, or at least you suspected something nasty or smart Alec had been said about you. There's none of this in these Union Pacific Shops. The men go right ahead attending to the work they are paid to do. So far as they are concerned, apparently, you might turn handsprings over the nearest tool cart, and they wouldn't notice it. But if you speak to them they are all

attention and courtesy. Somebody out there is responsible for these good manners.

A gray haired visitor tramping around one day among the various buildings came to one where a man was carefully pouring oil from one pail into another, and putting waste into certain large cans. The visitor asked for information. The workman smiled. "Yes, sir," he said, "I'm reclaiming oil and waste. I tell you, neighbor, there's no knowing just what I can save. But I need more buckets. Let me show you how I do this thing."

For several minutes the little lecture went on, interestingly. Then the visitor shook hands, ignoring the oil on the man's fingers, and went on his way to Superintendent Long's office. There he told the "Neighbor" story with genuine delight. The workman received more buckets that afternoon—all the buckets that he needed. President Carl Gray had attended to it.

O, well you think, there's a catch in this some where. There simply must be some trouble makers around. So you try to pry yourself into John Long's confidence. By taking a contrary attiture you get him started. You say something rather snippy about Labor and its grievances, and then, within what the scientific sharks call "an imperceptible period" you begin to learn why the shop forces believe in this man.

"You're wrong, you're dead wrong, mister," says this philosopher. "All we have to do is get the men in here around the table and let them talk. It seems to do some men a lot of good to talk. It gets poison out of their systems. To begin with they have to know this door is open. There's nothing 'Private' in here. Everything in the room belongs to the company. I could move out in ten minutes. I'm working for the Union Pacific, and so are the men. The only way I can get the right results is to have the right men do the right kind of work, and the right way to do this is to do the right thing by the right men. Am I right?"

Watchman's House, Main Entrance, Union Pacific Shops.

After you get this straightened out you take a deep breath and plunge in again. "You can't tell me," you begin somewhat defiantly, "that there are no trouble makers in this place. Why, great ——."

"That's precisely what I am telling you," the chief interrupts. "I certainly am telling you just that. Nine times in ten there are reasons for a trouble maker, reasons he believes are sound. All we have to do is get the chap into the office or corner him somewhere in the yard or the shop, and say, 'Now, look here, Bill, what the——' well, the first thing we know we've got the whole story. There may be no sense to it; but the man may think he's getting a raw deal. You just have to let him blow off, and then show him the facts, prove them to him; every man's entitled to this much. You have no right to bull-doze a man because he's under you and you think you can get away with it. Why——."

You try to assure the chief that nothing was further from your thoughts, but he is looking directly into your eyes, his face flushed with earnestness, and it seems best not to go too far with the argument. "Nothing bigger or more important in this world than the

Office of Superintendent M. P. & M., Administration Building, Union Pacific Shops.

man question, the way to handle men," he goes on. "We are firm but we try to put ourselves in the men's places for the moment. Practically all men want to be fair, and if they don't it doesn't take long to discover it."

The superintendent shows you a collection of engine parts, bits of flues and pipe and what not, all filled solidly with a white deposit. "Ah, ha," you exclaim "our old friends, Corosion and Pitting and so forth. Now, about the engine failures, Mr. Long."

"Well," he says, "we have certain rules about blowing out these things at stated periods, and occasionally they are violated. The engineer denies it, vehemently, and with much positiveness. Until he comes in here he doesn't know we have such parts sent in for examination. 'Bill,' we say, quietly and courteously, 'did you blow out that flue as usual?' Bill certainly did. 'Well,' we say, showing him the piece, packed solidly so that not a drop of water could be forced through it, 'how do you explain this?' Of course there isn't any argument. There are no hot words. Nobody's sore about it. Bill knows we aren't trying to put over anything on him. There's the evidence. There's no getting away from it. 'Guess I must've forgot,' he says, 'I'll sure watch that after this.' That man thought he was telling the truth. He wasn't deliberately lying. You just have to show him. Most men are fair."

You begin to describe a shop on a railroad which must be nameless in which you had noticed the men racing around after this and that and the other thing. "None of that here," says the chief. "Instead of checking a man for running around the plant after things we put the things where he can get them. We know men have to get a drink once in a while so we have the faucets close to them, dozens of them. Faucets cost less than time. Other things men must do every so often; you can't stop it, and we have the facilities conveniently placed. If men are to produce they must have proper tools, and we supply them. But we do insist that everything be in its place when not in use."

Rear View of Emergency Hospital, Union Pacific Shops.

"These little carts one sees so often in the shops and yards—" you begin.

"Until we got those carts," John Long smiles, "a man working a half mile from the shop, or wherever he might be when the whistle blew, had to gather up his tools and take them to the proper place for the night. This meant working ten or fifteen minutes or more for nothing, actually, and it didn't seem fair. So we put in the little carts, and now at quitting time the man locks his tools in his cart, and is on the way home in five minutes. Of course the carts are safe because the yard watchman guards them."

"There's no junk lying around on cabinets and window sills," you observe.

"If a child is disturbing the whole family by hammering," says John Long, "instead of yapping at him until you're tired and mad it's easier to remove the hammer. We put sloping tops on all our cabinets and built the window sills the same way. You can't store anything on either. The wheels on the blower lines, water lines, and so forth, are spot-welded so they can't be removed. Fittings on the blower and air lines can't be taken off and changed or lost, and this removes the embarrassment of getting after the men about it. Instead of the usual confusion about material being piled around the benches, we provide a cast metal vise stand so there is no place to congregate material. Vises, tool boxes, etc. are provided near outgoing tracks, convenient for the men, so they do not take long walks to and from these facilities to the work they are actually doing. Should we find men walking to and fro we inquire why they do this, and then we work out corrective measures, and do something that will remove that necessity."

"These flower beds," you say. "Who ever ordered a flower bed out there in the yard, and just why?"

The superintendent smiled. "That used to be the favorite spot for everyone to throw junk of some kind," he replied, "but no one would think of throwing junk on the flowers."

"It must cost a lot for caretakers, gardeners, and so on," you object.

"It does not. The men take care of those flowers and plants. They are proud of them. Time was when flowers were thought to be an unwarranted expense. But now you'll find them around all the buildings big and little, and every man seems to take delight

in caring for them. I wouldn't think much of a man who didn't like flowers."

"When you laid out these shops, Mr. Long," you begin.

"I didn't lay out these shops," he says, with a queer laugh. "We laid them out three years ago. We knew pretty well what we needed, floor space, the shop requirements, the machines available and others we should have to get. With these things in mind we laid out the floor plan on a specially constructed board. Then we cut to scale the machines we already had and colored them blue, figured out the machines necessary to purchase to take care of the work, and colored them red. The shop was then laid off in departments, link, driving, box, driving wheel, rod, piston, welding, etc. and machines given each department so they could take the parts from the rough to the finish. After these machines were pinned to the board in their suggested position, the men from all departments were called in, one at a time, and required to study the plan and say whether it met their approval. We impressed on them the importance of using their best practical judgment, as, after all, it would be up to them to produce. After every man had made his decision, the suggestions were analyzed, and the blue print of the location was made. The layout of the shop was by the men, and their added experience totalled up many hundreds of years. Machines in all cases were taken to the men and the work, and not placed in pretty batteries, and the men and work taken to the machines."

"It must take a new man quite a while to get next to things in a shop like this," you suggest.

"I'm glad you mentioned it," the superintendent says, reaching for a stack of books, and handing you one. "Every supervisor has one of these three volumes on his desk. They aren't put into the regular files. Here they'll find every mechanical instruction necessary for the job. If a man quits or dies the chap who takes his place just has to read up on the job, and before he knows it everything's working all right."

The Stores Department at the Union Pacific Shops, Los Angeles.

In a very large sense these volumes are the daily history of the shops. Any magazine or newspaper man would instantly set the highest value on their contents because they remind him of the "style book" of his own business wherein editors and reporters learn the standard practices of the shop to which they belong. Without such help every new man would be a tyro.

No matter how much you have traveled about, no matter how many wonderful shops you have visited you will find much to please you in John Long's department. You can not fail to be impressed by the deep earnestness of every man, from the top down to the interesting person in oil-glazed overalls sorting out reclaimed waste. They seem proud of their jobs, as they should be, indeed, and there wasn't a disgruntled looking man in the place. In three years, you learn, this unit has perfected a very fine apprentice system of instruction, a story in itself; standard mechanical circulars; standard shop practice folio; supervisors' conferences; apprentice board meetings; autogenous welding folio; air brake and other rules; four year examination of firemen; examination of federal inspectors; examination of car inspectors; examinations for boiler inspectors; examinations for apprentices, and the whole mass of this has been prepared in standard form for convenient use by every person needing such help.

But John Long and his associates have done much more than perfect the systems and operations and the landscape of the shops assigned them. They have gone into the desert places to make them livable and as pleasant as possible. "You can't get men and women to stay where there are no trees or grass or flowers," says the philosophical Mr. Long. "The first thing a man must have is a home. Without homes our labor turnover would be something terrible. It doesn't matter much how dirty and tired a man may be if only he can go to a home under trees, with plenty of water, and flowers and grass. Every tree in these little places on the desert is a blessing. The flowers are cash assets. They keep the men contented.

"Men must play, too. We have ball teams at Lynndyl, Milford,

Las Vegas; tennis teams at Caliente, Las Vegas and Los Angeles. The employes at Lynndyl have a ten-year lease on 4000 acres for hunting and fishing. We have bands at Los Angeles, Las Vegas, Milford, Caliente; basket ball teams at Las Vegas, Milford, Los Angeles, Caliente and Lynndyl; four indoor baseball teams at Los Angeles. We have horseshoe pitching teams at Los Angeles and Las Vegas shops; quartets at Lynndyl, Las Vegas and Los Angeles; orchestras at Los Angeles.

"This movement has been in effect on this unit only a little over a year, but is rapidly gaining in interest and activity. We know it pays. We have a lawn tennis court, a ball diamond, trap shootting, and basket ball court on the shop grounds here and won the championship baseball contest for the Union Pacific for 1927. Our band paraded this year at the Pasadena Flower parade. The men have a club house at Yermo with swimming pools; they have ball parks at all terminals. We just finished a lawn tennis court, rifle range and a trap shoot at Las Vegas. At Los Angeles we have bowling teams and the men have leased a bowling alley. We know these activities have brought the men closer together and raised the standard in shop morale. What better investment could the company make — an investment in men.."

It doesn't take long for the student of human beings to realize that the man able to get all these things done must have had a sound family tradition back of him. His manner, his general bearing and his attitude toward life make you conclude he must have come from a long line of pioneers, the sturdy stock that peopled the middle west and pushed the frontier farther on toward the setting sun. But you discover you're all wet. John Long's father was a Baptist preacher, and the son's first memory of him is related to a little church at Mendota, Ill. The boy's first schooling was in Moundsville, W. Va. Some of his father's deacons hoped he would follow in his father's footsteps, "but," said the man, "I had a healthy appetite that had to be satisfied, and I chose railroading as the safer calling. I enjoyed it so much that I stuck to it, and thank goodness I've always had at least three squares a day ever since."

Young Long's life was much the same as many another boy's whose father — particularly ministers — had left the family unprovided for; he had to work hard and in about any occupation he could get into until finally he landed as an apprentice. Much of the credit for things being in their proper places, where and when wanted, doubtless is due to the fact that early in life Long started to learn the plumber's trade, but quit when he discovered plumbers never had their tools where they were needed. Once he worked in a combination grocery-saloon; he studied candy making; he oiled cars in a coal mine; he drove mules but gave it up because as a minister's son he hadn't learned the language. Then, one never-to-be-forgotten day, he became a wiper in the Kansas City Southern shops. He held this job one day and was transferred to the cinder pit. In quick succession he went through a long list of jobs, car checker, air cleaner, coach cleaner, painter, car repairer, material clerk, scratch boss helper, laying on new cars, ditcher, ledgerwoods, etc., in upholstering department, coach truck department, and finally into the mill room where he stayed until the Spanish-American War, when he enlisted in the army and served six months in Company "B" of the Twenty-second, Kansas. After being mustered out again, Long returned to the K. C. S. and started working in the locomotive department, as an apprentice in the shop. Long joined the Frisco's force in 1900.

If you want to know how this man came up from the bottom you find the answer in his determination to study not only his own job, but the other man's. This studying did not consist merely in watching; he took courses of various kinds, wrote his papers, worked on them and made the grade. He learned, for one thing, never to demand something from a man which he couldn't do himself; and he is still studying. He has never quit. He never will, apparently. His experience has been broad and deep. He served overseas in the World War as a captain of engineers, 395-396 Casual Company inspector of equipment in France. He was master mechanic of the French shop on the Paris, Lyons & Mediterranean RR at Nimes, and of the American shops at San Sulpice. He was assistant supervisor of equipment at Washington in 1918-1919 for the United States Railroad Administration. He was with the B & O too, for a while, and finally, in 1923, he became superintendent of motive power and machinery for the Union Pacific at Los Angeles.

"And now, after all this," you inquire, "just what do you consider your chief asset; what is the most interesting thing?"

"Men," was the quick reply. "Just men. If I can stand well with the men I'll ask nothing else. If I do this I'm certain to stand well with the company."

And man, said Gladstone, is the crowning wonder of creation.

American railroads use one-fifth of the fuel oil produced in this country every year. In 1925 the railroads used 70,636,559 barrels of fuel oil, mostly for locomotive fuel.

One-half of the mahogany imported into the United States comes into the country through New Orleans.

British Diners Pay Big Profits

Meals Table d'Hote

By Arthur L. Stead

In a German Kitchen Car. The Women, You Notice, Also Help in the Work of Preparation.

NO SURER means exists of attracting passenger business to a railway than adequate, satisfactory dining car and hotel service. Britain was a leader in Europe in developing this feature of transportation. That country's largest railroad, the London, Midland & Scottish, owns and operates 276 diners; the London & North Eastern owns 188 such cars; the Great Western has 80; and on the Southern Railway there are 85. In addition to these vehicles, refreshment buffets are included in the makeup of certain ordinary day cars.

Generally speaking, the dining cars in Britain have been built in the railroad shops, and are operated by the railroads themselves. An exception is found in the case of the Southern Railway. Here the dining car service is intrusted to private contractors, an arrangement which has given complete satisfaction. Apart from the Southern, the dining cars in Britain are controlled by the catering superintendents of the railroads themselves, these officers working in close cooperation with the passenger traffic managers. The runs constitute single daily trips up to 200 miles; double daily trips up to 440 miles; and a number of two day trips running up to 800 miles.

Working methods on the dining cars of the various British roads correspond closely. The L. M. & S. dining car organization is managed by the controller of hotel services, Arthur Towle, whose headquarters is in London. There are two main depots in that city, one at St. Pancras, the other at Euston. From these depots come the supplies of fish, meat, vegetables, for the cars worked from London, St. Pancras serving the Midland division of the road, and Euston the North Western division. The cars are supplied at the start from these points, but they can and do augment their provisions when necessary from both the hotels and refreshment rooms of the road en route.

On the shorter trips, the cars are supplied in London for a double journey, but on the longer runs (for instance, to Glasgow, which occupies eight hours) they are equipped only for a single journey and are re-provisioned at the other end. On the dining car service between London and Scotland, the men work up one day and back the next, but on the shorter runs the dining car trains go there and back in one day, and the cars are operated by a single staff.

Much of the stock drawn by the chef from the depot already is prepared for cooking, thus lessening the work to be done on the car. At times 224 meals are served on one train at a single sitting. The kitchen cars using gas for cooking, are packed tight with

every modern cooking device. Menus usually are made up in the central depots in London. The chef consults the menu and draws on his depot for whatever quantity of food he needs. All meals, except tea, (an afternoon institution not familiar to Americans), are table d'hote. For breakfast one has the choice of fish, bacon and eggs, cereal, etc., while luncheon and dinner consist of soup, fish, entree, joints, sweets, cheese and coffee. Luncheon is a four course meal and dinner five courses, the menus being changed from day to day. When table d'hote meals are not available, light refreshments may be obtained, such as eggs or cold meats. Wines, spirits and beers of every kind are obtainable on all cars. Breakfast and luncheon cost three shillings and sixpence, about 85 cents in American money, and dinner four shillings and sixpence, ($1.09) and five shillings and sixpence, ($1.34) for third and first class respectively.

Four million meals are served every year on L. M. & S. dining cars. The week end rush often involves the serving of 25,000 meals over and above the usual services, but this big business is welcomed by the railroad, for dining car catering in Britain yields a reasonable profit for the railways

Kitchen Car Serving Diners on the London, Midland & Scottish Ry.

and is never undertaken at a loss as in America.

No figures are available of the net profits yielded by the dining cars operated in Britain, but the following are the net profits derived from both dining cars and refreshment services in hotels and at stations for the year ended December 31, 1926, an unusually lean year, when takings were seriously restricted owing to labor troubles which depressed the country: London, Midland & Scottish, $2,653,663; London & North Eastern, $1,425,023; Great Western, $332,226. It probably is due to the fact that all dining car meals in Britain are table d'hote, and not a la carte, as on so many American roads, that such handsome profits are realized on this side. A la carte service inevitably tends to lengthen the duration of the meal, and only by adopting the table d'hote method are the British roads able profitably to cater to the enormous demands of travelers.

Dining car crews in Britain work something like 11 hours a day overall, hours of duty varying considerably according to the service to which the men are attached. At a recent meeting of the railroads and the men's representatives it was agreed that dining car crews should not be required normally to work more than 120 hours in a fortnight.

Free uniforms are provided for the conductors, waiters and pages, and all grades receive their food free while on duty. Tips are pooled among the entire crew. On a normal service the dining car crew consists of one conductor, two waiters, one page, one cook and one kitchen boy. On busy services, this is strengthened by an additional waiter and a cook's assistant.

The dining cars employed in Britain often are designed on the articulated principle, each unit consisting of a kitchen car in the cen-

And This, As Doubtless You Have Discovered, Is the Exterior View of the Kitchen Car on the L. M. & S. Ry.

ter with a first class diner on one side and a third class diner on the other. On the Great Western the total length of these articulated units is 151 feet. On the London & North Eastern a feature is the use of electrical cooking apparatus, replacing gas for this purpose on all the important Anglo-Scottish trains out of the King's Cross terminal in London. New kitchen cars built by the London, Midland & Scottish are 50 feet long, and have a kitchen in the center with a pantry on either side. The kitchen equipment includes a large gas stove with three ovens, a hot plate and two hot water boilers. A special plate warming cabinet is capable of heating 500 plates at one time, and in the pantries is installed an efficient refrigerating and wine cooling plant.

Cosy Corner in a London, Midland & Scottish Diner.

Across the Channel, admirable dining car services are operated over the main continental roads. So far as known, no dining cars are operated by the government owned railroads of Europe, outside Scandinavia, where a few cars are run by the railways. Dining car services in the mainland of Europe are operated by two large undertakings, the International Sleeping Car Co. with headquarters in Brussels, and the Mitropa Company of Berlin. The German undertaking operates principally in Germany and Central Europe, while the International Company cares for the dining car services of western Europe and those operated on the leading trans-continental expresses. Both of the companies named operate at a profit, although the Berlin undertaking is subsidized to some extent by the German Railways. All meals are table d'hote.

The Mitropa Diners Give Excellent Service, the Author Says, in Germany. Notice the Bottles Beside the Mitropa Zeitung!

Very long runs are made by the International dining cars, which link one end of Europe with the other, and the catering is exceptionally efficient, and moderately priced. The Mitropa undertaking operates between Berlin and all important central European points, and in a single year serves 2½ million table d'hote meals in its cars. The monthly consumption of provisions is rated at 1,500 cwts. of meat, game and poultry, 200 cwt. of fish, 2,200 cwt. of potatoes, 105 cwt. of coffee, 4 cwt. of cocoa, 4½ cwt. of tea, and nearly half a million eggs. Twenty-five depots are situated at selected points for provisioning the

MENU

BREAKFAST 3/6

Tea Coffee Cocoa

Porridge

Kippers Grilled Halibut.

Pork Sausages and Tomatoes

Grilled Bacon and Eggs

Cold Ham Saute Potatoes

Preserves

Cup of Tea or Coffee after Luncheon or Dinner 4d extra
THIRD-CLASS 24-6-27

Mitropa cars. Every day there are washed in the company's laundries 2,500 table covers and 13,500 serviettes.

The kitchen of the Mitropa cars measures 11 ft. 3 inches by 7 ft. 4 inches. The stove plate is 5 ft. by 3 ft., and the passage between the stove and the kitchen table is 3 ft. 6 in. wide. The kitchen crew consists of a cook and a female assistant, and four course meals are the order of the day. Lunch and dinner cost about 85 cents and other meals are equally low priced. A normal meal consists of soup, a fish or egg course, meat with vegetables and potatoes, and a sweet course consisting of pies or puddings. Cheese, fruit, biscuits and coffee are also served. The meals are served on large platters from which the passenger helps himself, and a second helping invariably is offered the traveler.

In the study of the European dining car situation, it should be noted that in Britain the working of the cars is facilitated materially by reason of the fact that their operation is closely bound up with that of the hotels and station restaurants owned and operated by the railroads themselves. Each of the British roads operates an extensive chain of hotels and guest houses. The London, Midland & Scottish Ry. hotels actually form the largest group of hotels under one management in Europe. They are to be found in almost every corner of Britain, from London to the Scottish Highlands. Some are in the industrial cities; some in scenic resorts, and others in places of historic interest. In many large cities such as Liverpool and Manchester, the railroad hotels are the acknowledged center of the social life.

In such places hotels have been built because of the importance of the city, but in others the L. M. & S. has taken the bold step of building the hotel first and thereby creating a place of importance. This applies to the golfing hotel at Turnberry, and above all to

Eclipse of Sun Special.
June 28th, 1927.

SUPPER 3/-

MENU

Roast Mutton, Onion Sauce

Cold Meats

Vegetables and Potatoes

Compôte of Fruit

Rice Custard

Cheese and Salad

Liqueur Coffee, per cup, 4d. extra.

Gleneagles, in Scotland. The latter was merely a stretch of moorland backed by distant mountains, before the railroad took it in hand. First, golf courses were created; then the hotel, and now Gleneagles is one of the leading meeting grounds of society in Britain. So much can railroad foresight and energy accomplish.

The European roads are proud of their admirable catering services. The luxurious hotels on wheels which form part of every long distance train provide accommodation for the traveler unexcelled in any land.

Swansea Car (2) June 28th, 1927.

DINNER 5/-

MENU

Puree Portugaise

Fried Cod, Tartare Sauce

Roast Beef and Horseradish
Roast Chicken and Bacon
Cold Meats
Vegetables and Potatoes

Banana Chantilly
Pouding Genoese

Croûte au Jambon

Cheese and Salad
Biscuits (Huntley & Palmers)

Dessert

Liqueur Coffee, per cup, 4d. extra.

COMPTON CERTIFIED MILK SUPPLIED ON THIS CAR.

Every life is its own excuse for being, and to deny or refute the untrue things that are said of you is an error in judgment. All wrong recoils upon the doer, and the man who makes wrong statements about others is himself to be pitied, not the man he vilifies. It is better to be lied about than to lie. At the last no one can harm us but ourselves.—Elbert Hubbard.

It is the duty of every man to protect himself and those associated with him from accidents, which may result in injury or death.—Abraham Lincoln.

When a locomotive whistles for a grade crossing, it is best to believe all you hear.—Uncle Philander.

The Pineapple Specials of Hawaii

By Dorothy Musgrave

The O. R. & L. Ry. Has 175 Miles of Line, Twenty Miles of It Double Tracked; Three-Foot Gauge; Most of It Equipped With Electric Block Signals. The Roadbed Is Ballasted With Coral.

YOU can't say much about the railways of Hawaii without running into pineapples and sugar cane, but the combined story is immensely interesting. Far from the mainland, the designation applied by the islanders to continental America; dependent for the most part upon its own resources; with a staff of employes made up of five races; with two principal commodities supplying most of the freight traffic, and a dwindling passenger business, the way in which the management set about, successfully, to overcome somewhat discouraging conditions makes a fine chapter of operating efficiency and real cooperation among men.

The four principal islands have their respective railway lines, all of them common carriers with the exception of the Kauai road, but the Oahu Railway & Land Company's line on Oahu, the island on which Honolulu is situated, is the longest in the group. Being the only railroad on the island the O. R. & L., doesn't bother to stencil its name on its box cars. It really isn't necessary; no one is going to switch them into the wrong yards, there are no per diem payments to make to other lines, and all repairs are made at home, and made right, an ideal situation as all railroad men will admit.

On old King Kalakaua's birthday, 38 years ago, November 16, 1889, the formal opening of the O. R. & L., took place, and the dream of a New England youth was realized. B. F. Dillingham, the James J. Hill of Hawaii, foresaw the need which had come with the years. On August 30, 1888, he obtained from the legislature an exclusive franchise for 20 years to construct a railroad on Oahu, with the stipulation that it be completed and in operation between Honolulu and Pearl harbor within 18 months. This task accomplished, successive extensions were made until the rails reached Kahuku, 70 miles from Honolulu. Later, a branch line was constructed to Wahiawa, the loading point for the famous pineapple trains running as specials. Near Wahiawa is Schofield Barracks, 20 miles from Honolulu, the largest army post in the United States. It was Mr. Dillingham's vision and perseverance that made possible the cultivation of the plateaus of Oahu which once were barren cattle ranges but today are yielding record breaking crops of sugar and pineapples. The Oahu railway hauls 248,000 tons of sugar every year from the island mills to its own modernly equipped terminals in Honolulu harbor where it is loaded on ocean freighters and sent to mainland refineries.

There are no car shortages on the O. R. & L., and no regional advisory boards in the islands. The road's officials keep in close, personal touch with the fruit crop conditions everywhere in their territory, and have cars where they are needed, and at the right time. The importance of this is seen in the fact that the Hawaiian Pineapple Co., produces a tonnage sufficient for canning 1,640,000 cans of pineapples every day, and sometimes a great many more than this, and this tonnage must move promptly and rapidly, without interference.

The O. R. & L., has about 175 miles of three-foot gauge track, 20 miles of it double tracked, and most of it equipped with electric block signals. The line serves practically the entire island, skirting around the mountains, along the seashore on three sides with one line up to Fort Schofield, nine miles of three per cent grade. The roadbed is ballasted with coral, and is an excellent piece of construction well maintained.

Passenger service is maintained over the most of the system by motor equipment. The decision to adopt this form of transportation grew out of the fact that steam equipment, with rear end observation, was not attractive for tourists.

The Motorman's Station in This Coach Is Lowered to Give Passengers An Unobstructed View of the Scenery.

In the present coaches, built by the company's forces, the operator's station is lowered so that the passengers may see over his head, an unobstructed view of the islands. These cars are 60 feet long, with seating capacity for 60 passengers. They have four-wheel trucks, and weigh about 52,000 pounds complete, are equipped with two 100-horsepower R. M. C. power units, and Melcher-Hyatt roller bearing journals, and have a maximum speed of 50 miles an hour. Four such cars have been built, and more are contemplated in the near future. One, and sometimes two trailers are hauled, principally for baggage and perishable foods. The company's shops are exceptionally complete, the working force consisting of Hawaiians, Japanese, Chinese, Portuguese and Americans turning out work equal, and very often superior to much that is done on the mainland. A great deal of this good record has been due, doubtless, to necessity, but expert management gets much credit. Necessity led the company, early in its operations, to begin building its own cars. This policy it continued until, in 1918, it built 50 30-ton cars, and completed two of five passenger coaches then under construction. Five locomotives were bought recently bringing the total to 30 now used. The company owns 1115 cars of which 64 are passenger coaches. The road carried 976,330 tons of freight and 1,053,000 passengers last year.

Every railroad man keeps his weather eye open for certain troubles in construction days. But the troubles encountered by the O. R. & L., in addition to those to be expected ordinarily, were augmented in those early times in the islands by elements human as well as geographical. Native superstition played its important part. The winds, the sands, and even the lovely clouds that curl over the mountains proved to be forces that played the engineers many a weird trick. One night, for instance, just as the sun had sunk into its blue ocean bed the foreman on a bridge job down the line found his camp deserted. It wasn't because of wages nor time nor soap box agitation that the construction gang had walked out. It was because a native had discovered near the camp site an old "heiau" or temple, and superstition made that vicinity too awesome for the comfort of the workmen. The next morning the foreman found his gang several miles down the line where the men had retreated for the night.

As the work of construction progressed along the northwestern shore where the track runs close to the sea, the winds blew the shifting sand over the rails, and every attempt to keep the road clear proved of no avail. It was then that an idea was put into execution which has changed the appearance of that side of the island for some distance. Great numbers of Australian ironwood trees were planted between the rails and the sea. Today, the immense trees, grown from those striplings, protect the track from the sands and make a beautiful green frame for the picture of clouds and ocean beyond.

The old Hawaiian locomotive engineers on the line can tell many a joke their humorous minds have conceived to play on their fellow workers, the Chinese and Japanese, along the way. There was the early morning when a locomotive pulled into a small station. On the platform stood a Chinaman beside a great mound of watermelons. The engineer stepped down from his cab. "I buy. Twenty-five cents," he said.

The O. R. & L. Shops Are Well-Equipped, Maintained in Perfect Order, and Turn Out Jobs Equal to Anything Done on the Mainland.

The Stacks of the Sugar Mill Tower Against the Sky. Waipahu, on the O. R. & L. Ry.

The Chinaman shook his head. "Fifty cents" suggested the engineer. "Boss say no can sell," answered the Chinaman, shaking his head so hard that his big straw hat looked as if it were spinning. The engineer began to circle the pile of watermelons until he spotted a big one next to the track. With a quick movement he lifted the fruit, and with a leap and a swing was in his cab. A hand on the throttle, and away went the train. As the engine gained headway he looked back. In the middle of the track stood the Chinaman waving his arms and screaming, "No can sell."

The country through which the mainline of the O. R. & L. takes you is characteristic of the scenery of the island. Leaving the new terminal station in Honolulu the train winds around the shores of Pearl harbor where the naval station containing the only dry dock ever built in coral is situated. Past duck ponds, and the quiet stretches of the harbor where Japanese women wade in search of seaweeds the train runs dry shod on its coral roadbed. Groves of banana trees are set out along the way, and in the taro patches Hawaiian women dig for the roots of the big leaved plants. Through the brilliant green of the rice fields the track runs into the richest sugar section of the island. The maturing cane tosses its plumed heads above the windows of the coaches and the sweet molasses odor fills the air.

One of the Coaches of the O. R. & L. Ry., on the Island of Oahu.

The plantations give way to forests of the feathery kiawe trees as the track approaches the sea coast again. Along the way groups of Japanese roadmen sit cross legged in the shade eating, with slender red chopsticks, their noonday meal of rice. Here and there in the more open spaces the Hawaiian cowboys canter along the slopes, and the cotton grows wild among the vari-colored blossoms of the lantana bushes.

The brilliance of the sea flashes suddenly upon one as the forest is left behind, and the track takes up its course along the sea coast for the last 45 miles of the road. Long stretches of white sand are broken here and there by jutting promontories of black lava over which the vivid blue sea unfurls its white breakers. Some of the dunes emit a growling sound when anyone slides down them, the famous "barking sands" found in several places throughout the islands. The mountains compete with the seashore for the traveler's attention. Peaks rise in a ragged flank, and offer now and again a glimpse of shadowed valleys where one finds waterfalls.

Open beach homes are scattered along the many protected bays, and new colonies of Honolulu residents are building places for week end vacationing in new sections recently placed on the market.

Half way along the southwestern side of Oahu lies the graceful crescent of Pokai Bay. In its shelter a fleet of Japanese sampans swings at anchor, and on its white sands the fishermen spread their nets. Close by, the sugar cane en-

croaches on the little village of Waianae, and back from the shore the stacks of the sugar mill tower against the sky. On again the railroad follows the shore, but the glistening sands have disappeared, and in their place the black lava stands out against the pounding of the sea. Caves and arches cut into the rock by the ceaseless tossing of the waves honeycomb the lava beaches.

Eight miles from Waianae the railroad skirts Makua Beach. A hundred yards from the little station is a great cave, the delight of would-be-explorers. Countless trails into the valleys are the haunts of picnic parties, for the O. R. & L., although running on a definite schedule, will stop anywhere along the line to pick up a party, an example of efficiency plus accommodation.

The four principal islands of the Hawaiian group have their respective railway systems. The variety of scenic beauties revealed to the passengers is a delightful surprise. Traveling in comfortable, modern coaches the tourist looks out on the snowy peak of Mauna Kea gleaming under the blue of the tropic sky, or glimpses the Hawaiian fisherman casting his net in an opal sea. Great fields of sugar cane, row upon row of pineapple, the groves of shaggy palms, the broad leaves of the banana trees, a panoramic study in greens. In some cases the railroads follow a route inaccessible by automobile, and so offer a way into beauty spots otherwise unavailable to travelers.

On Hawaii, the big island, 123 miles of railroad is in operation. Along the picturesque Hamakua coast a remarkable feat of engineering has laid a railroad over the long disintegrated lava gulches where streams run through rich sugar cane fields to meet the warm waters of the sea. On Maui, the second island in size, the first railroad built in Hawaii follows the northern side of the Valley Isle for 42 miles, and branches into the pineapple and sugar fields of the interior country—a wonderful, charming land to see, a land to which in the future years you will always hope to go back.

Where the Accident Started

A public utility company recently made an analysis of 200 typical accidents and found out that "inattentiveness" was at the bottom of 8 per cent of them. Reports of automobile accidents collected by the National Safety Council show that inattentiveness is also involved in a large proportion of highway smashups.

That word "inattentiveness" covers a lot of ground, and may be due to any one of a number of causes. One of them is making up sleep lost the night before while on the job next morning.

There is no set rule for the amount of sleep that any individual requires. Most of us need eight hours; some may be even better off with nine; others can worry along with seven. There may be a few who can get by with less, but it is not a safe rule for the average person.

How many accidents have had their origin the night before will never be known, but in many a case the investigation has shown that the injured man "didn't seem to be himself that morning."

It's hard to be yourself after three or four hours sleep, particularly if morning brings a head that feels the size of an overgrown pumpkin, and parched tissues set up an insistent demand for ice water.

Many a man who hit the hay at 3:00 a. m. has resumed his rest in a hospital cot before noon. Better pick the night before a holiday for your "night out."—The Studebaker Cooperator.

Pineapple Field on the Island of Oahu on Which Honolulu Is Situated. Bananas in the Foreground.

Editorial Comment

The Editorial of This Edition

ALMOST the whole history of American railroads is to be seen in a comprehensive way on the cover of this month's magazine. A reproduction is shown there, in part, of a poster made for the great centenary of the Baltimore & Ohio Railroad at Baltimore. In this picture at the right is the diminutive engine with which this famous line began its mechanical operations almost a hundred years ago; for locomotives were not used when the road started its career. Horses supplied the power. Occupying the remainder of the available space is a typical specimen of the mighty engines now in use.

The full significance of this picture comes, however, when one reads this paragraph from an old history:

> In 1831 the Baltimore & Ohio Railroad Company offered a premium of $4,000 "for the most approved engine which shall be delivered for trial upon the road on or before June 1, 1831; and $3,500 for the engine which shall be adjudged the next best." The requirements were that: "The engine, when in operation, must not exceed three and one-half tons weight, and must on a level road, be capable of drawing day by day fifteen tons, inclusive of weight of wagons, at fifteen miles an hour."

The winner of that contest for power and speed was the York, built by Phineas Davis, a clock maker! It traveled from its birthplace at York, Pa., on wagons over the turnpike to Baltimore, and it proved to be the progenitor of the grasshopper type of engine used for so many years on the first railroad. With a few modifications the York did what the company wanted done, and everyone was immensely pleased.

A few days ago, in announcing some of the exhibits to be shown at Halethorpe, the Baltimore & Ohio told of the arrival of the 1112, a modern freight engine of the Western Maryland Railroad, which, with its tender, weighs over 400 tons. The York, weighing about three and one-half tons, could be taken over the line on a modern motor section car. But the York was a valiant little engine, and it served the road faithfully for a long time. Indeed, one of its kind actually continued in operation for more than 60 years, and was shown among other interesting exhibits at Baltimore in the great pageant, ten days ago.

Still further respect for the marvelous facilities of today is bound to come after reading one more historical reference describing the first trip of the Stourbridge Lion, driven by the redoubtable Horatio Allen, the first to perform such a reckless feat in this country. That was in August, 1829. Many years afterward, when he was a very old man, Mr. Allen wrote:

> When the time came, and the steam was of the right pressure, and all was ready, I took my position on the platform of the locomotive alone, and with my hand on the throttle-valve handle said: "If there is any danger in this ride it is not necessary that the life and limbs of more than one should be subjected to that danger."
>
> The locomotive, having no train behind it, answered at once to the movement of the hand; soon the straight line was run over, the curve was reached and passed before there was time to think as to its not being passed safely, and soon I was out of sight in three miles' ride alone in the woods of Pennsylvania. I had never run a locomotive nor any other engine before; I have never run one since.

It is very likely that the Baltimore & Ohio never would have been built, or at least not for many years later, if the merchants of New York and Philadelphia had not been good hustlers in the early days of the last century. Their contribution to this great enterprise consisted of competition so keen that the business men of Baltimore saw the necessity for starting something, and doing it right away. The Erie Canal hasn't been blessed for very many things, and it has been blamed for a great deal, but it was this waterway, with the lively pep of New York and Philadelphia merchants, that created the demand for the railroad whose hundredth anniversary has just been celebrated at Baltimore.

The original plans for the Baltimore & Ohio, the country's first commercially successful railroad, provided for a line 380 miles long to be finished in ten years at a cost of ten million dollars. As a matter of fact the rails did not reach Wheeling until late in December, 1852, about 25 years after the company was organized, and the entire cost of the project including equipment was $30,000,000 instead of $10,000,000.

Step from that picture to this one:

The Baltimore & Ohio which began a hundred years ago in such a primitive way, has grown into a system having 5500 miles of main line. The system as it stands today represents an investment in tracks, real estate, buildings, and, equipment of approximately $900,000,000 and gives employment to about 70,000 men and women. During 1926 this railroad carried more than 111,000,000 tons of freight an average distance of 187 miles for each ton. It carried more than 13,000,000 passengers, and performed a substantial service in carrying the mail and express. In payment for all the service so performed the Baltimore & Ohio received, in 1926, over $252,000,000, and it paid out as wages to the employes of the company over $110,000,000. The

company paid as interest to the holders of its bonds and fixed securities about $29,000,000, and it paid about $11,000,000 as dividends to the holders of its preferred and common shares. During the same year it paid in the aggregate nearly $12,000,000 for taxes.

From that humble beginning with thirteen or fourteen miles, a hundred years ago, America's transportation system has risen as scarcely any other enterprise in the world has done. Today there are more than 2,000 railroads in the United States of one kind or another, long and short, Class I, II, or III, and the mileage has grown to more than 400,000, if one counts all tracks, or about 260,000 miles of road. These properties are valued by the government at about 23 billion dollars, an outrageously unfair figure used to support inadequate rates. In 1926 the Class I companies alone paid more than 360 million dollars in taxes, a sum nearly 30 millions in excess of dividends paid to the owners. These roads pay more in interest every year on their funded indebtedness than was spent in the first 25 years in building the original Baltimore & Ohio Railroad.

In the beginning railroads were welcomed everywhere with silver cornet bands, if the people could get them. Now, the band is made up of commissions, federal or state, with motor buses for the passengers, trucks for the freight, and airplanes for the mail and express. We live in an exceedingly high pressure age. Most of the world is speed crazy. Travelers on railroads are impatient because trains do not cross the entire continent in the time now needed in going from Chicago to the Pacific Coast. Airplanes fly casually at more than a hundred miles an hour and, as Major Arnold shows in his absorbing article in this issue, they have actually flown three times that fast, and may soon exceed even that amazing rate. Contrast these achievements with the early day requirement of 15 miles an hour by the Baltimore & Ohio, and you have a mental picture of the world's advance in transportation.

Because it is in a very great hurry the public, thinking only of reaching its destination, seldom realizes the perfection attained in steam transportation in 100 years. A railroad wreck is a rare occurrence nowdays. Train control has reached a high degree of safety either through telegraph or telephone orders or by means of automatic machinery taking the whole business out of human fallibility.

From 1859 to 1864 traffic more than doubled, and it continued to increase after the close of the war. The great war in 1859 between the New York Central, the Erie, the Pennsylvania, and the Baltimore & Ohio was destructive. At least two of these companies were almost bankrupted, and of course the public suffered. In the first six months of 1865 the Michigan Southern earned 23 per cent more than in the same period of the previous year, but still had no money for dividends. Every dollar had to go for new equipment and construction. Nearly everyone had a pass. A director of a western road said in Harper's Weekly that much of the trouble was due to the deadhead system. Said he, "We have to pass all members of the legislature, editors and politicians for fear of hostile legislation. Our freight agents pass all the merchants in order to get the freight. The conductors pass all tavern and hotel-keepers, livery stable keepers, theatrical and "fancy" people for obvious reasons. Nobody that I can discover pays his fare on our line except green emigrants, foreign travelers and a few farmers."

We growl somewhat over excessive governmental regulation—and there are more than 5,000 laws of this kind—but almost anything is better than the conditions described. They were the conditions, beyond a doubt, which brought about the public demand for government control of practically everything. Indeed, the first state commission appeared only a few years later in a western state.

Some thoughtful gentleman said a long while ago that in all great undertakings the pioneers suffered —the second and succeeding generations reaped the benefit. It was so in the growth of America's railroads. Wherever a new line went it took progress with it. The Illinois Central R. R. published broadcast an advertisement in 1865 announcing it had 900,000 acres in Illinois, on both side of its tracks, for sale at from $9 to $15 an acre. Forty acres could be bought for cash for $360, just about the price one acre would bring today in a large part of that region.

The Baltimore & Ohio was the advance guard of a mighty host in the march of civilization on this continent. It took a leading part in one of the world's greatest dramas. It has contributed very greatly and liberally in a hundred years to the comfort and happiness of human beings. From humble beginnings it has become a wonderful property operating under the most intelligent and energetic management. Its place in American history is certain but no more secure than the fine opinion it has created for itself in the hearts of the whole nation.

The New Haven's Anniversary

The New York, New Haven & Hartford was 55 years old in August. That is a wonderful age. Among men life's chief ambitions have been realized or laid away in camphor forever. Usually you know where you are headed at 50 or 55, a great compensation in itself. The New Haven knows where it is going. Under its present efficient management it is progressing marvelously and can look back with some satisfaction to things it has lived down, just as some men may do.

The real beginning of the New Haven system came as a result of a firm resolution to establish land communication between New York and Boston in order to avoid the dangers of the journey by sea. This resolution was realized in 1847 with the opening of the line from New Haven to New York, thus completing the all-rail route from Boston to New York, broken only by ferries across the important rivers.

The New Haven has coordinated both steamship and motor coach service with its rail lines. It was the first railroad in the country to undertake electrification and it has been the leader in the adaptation of the gas motor to rail service.

What Man Hath Wrought

Respect in large measure must be granted the brains that conceived the first little engines that pulled four or five tons of freight around curves and up impressive grades in the early days of railroading, Watt, Trevithick, Stephenson, Hackworth, Burstall, one and all fired by the same hope. Not many persons, in these hurrying days, have time and inclination to read the story. And it's a pity. Watt, in the belief of the multitude perhaps, stands for only one achievement, the stationary engine, or the thing they meet when they pay their electric light bill. But if it had not been for the inventive genius of Watt the world might have waited much longer for motive power.

The locomotive had many inventors. No one knows how many, and most of them labored in a time long before the world was ready for their product. The Marquis of Worcester once found a man behind the bars of a cell shouting, "I am not mad; I am not mad." The Marquis inquired of the keeper what the man had done. "Ah," said that functionary, "he says he has discovered the use of steam from boiling water. Of course he's mad—as mad as the enginewright who said he could drive a 'locomotive' at more than twelve miles an hour!"

James Watt included a locomotive in his patent of 1784. Shortly afterward, William Murdock, his assistant, had the model at work at Redruth and terrified the parish clergyman. This model is now at South Kensington. It was Murdock's pupil, Trevithick, who really struck the main line locomotive development. He used high pressure steam; he used smooth wheels on a smooth rail; he turned his exhaust steam into the chimney to increase the draught and he gave the tube along which it traveled the name of "blast-pipe." It was on February 17, 1804, that Trevithick's first locomotive was publicly tried.

And then one turns to the motive power wonders of today, stepping blithely over all the efforts that lie between. What might it have meant for the future of transportation if the school children, or the college students any way, to have attended the great railroad exposition at Baltimore! Once in a while the heart gains new courage and hope over the discovery of a school teacher willing to admit that something the children really enjoy may actually be instructive. Such an incident came a few days ago when a teacher in a little school, in a secluded little town, took his entire enrollment down to the station to see a new locomotive just put into commission by the Santa Fe System. This giant of the rails has been undergoing tests on the run from Winslow, Ariz., through New Mexico over the Rockies to La Junta, Colo., a distance of more than 600 miles. This engine, it is said, has shown an easy speed of more than 70 miles an hour on stretches of the run through Arizona and New Mexico with heavy trains of eight to fourteen cars.

This new Santa Fe giant from the Baldwin shops is nearly 100 feet long with the tender, weighs 709,300 pounds, and has a tractive force of 68,000 pounds. The drive wheels have a diameter of six feet one inch. The fire box has a heating surface of 306 square feet, or equal in size to an ordinary bungalow room. The engine has 4981 square feet of tube and a superheater surface of 2250 square feet. The tender has a capacity of 15,000 gallons of water and 20 tons of fuel, thereby enabling it to travel long distances without change excepting crews.

Why shouldn't the children know about such things?

The Mysterious Commission

The decision of the Interstate Commerce Commission granting to the California deciduous fruit industry, effective November 10, a reduction of 13 cents a hundred pounds on shipments to the East, was far more important in drawing attention to several distinctly objectionable conditions, than it was in giving financial relief which that industry said it needed. Students of economics find interesting material in the story. The rates which were condemned as being too high are, it appears, lower than the rates on deciduous fruit from the principal producing areas to the same destinations. For example, the rate on grapes from Arkansas to New York is $1.73 a hundred although the distance between the two points is about half the distance between New York and California, where the rate has been $1.62 a hundred pounds on fresh deciduous fruits other than apples in carloads at $1.73 with the same carload minimum to other eastern seaboard points.

The rate on New York grapes for an average haul of 354 miles is 68.5 cents which is 47 per cent of the first class rate for that distance under what is called the consolidated southwestern scale. The

rate on peaches from Fort Valley, Georgia, to 16 points mainly in the central territory, would, if projected to the transcontinental distance, result in a rate of $1.96. The rate on deciduous fruit from Utah and Colorado to Pittsburgh and the East is $1.73; from Idaho to the same points $1.87½ and from Oregon and Washington to Chicago and the East $1.87½. The rates from Idaho, Oregon and Washington were found not unreasonable quite a long time ago. Truly, the Interstate Commerce Commission works in a mysterious way its wonders to perform.

Transportation in the West

Transportation in what is technically known as the western district includes three quite well defined classes of traffic. There is a clear line of distinction between the principal products of the states east of the Rocky Mountains, those west and the southern section of the western district. The states included in the north central region are agricultural, producing a great variety of grains, live stock, poultry and dairy products. The territory south of this produces vast quantities of grains and cotton with a lesser amount of livestock.

The territory west of the Rocky Mountains produces vast quantities of fruits, early vegetables and lumber. The larger part of this, that is the fruits and vegetables, presents a distinct problem. This class of produce must be marketed at once or preserved for future use by canning or dehydrating. Vast quantities are marketed as fresh fruits and vegetables, and make the most exacting demands upon transportation of any class of traffic which moves by railroad.

The larger part of the products of the area east of the Rocky Mountains can be handled leisurely. While live stock makes great demands upon transportation, it is a product which comes to market at all seasons of the year, a characteristic contributing to its efficient handling.

The opening of the Panama Canal linked the coasts, east and west, so that the manufacturing districts of the East are in far closer communication with the Pacific Coast districts than before.

It seems reasonable to suppose that as the years pass the Middle West will develop more and more as an industrial territory and will provide a home market for the agricultural products of the region. It will prove to be also an expanding market for the fruits and vegetables of the Far West which must be served through railroad transportation.

Most of our comments in connection with railroad service are associated with past experiences, but our real interest is in the future of railroad transportation, for if the growth and development of the Middle West is to continue, it is necessary that the means of transportation which will contribute to their development shall be kept in perfect order, and provision made for its expansion as the future economic development may require.

A Plate of Jiggs

Corned beef and cabbage, New England boiled dinner, and Irish stew have come back, says Otto Paul Reiss, the smiling supervising chef of the Southern Pacific's dining car service. We were not aware that any of these delicacies ever had been set aside. All three have been constantly on duty, world without end, particularly in the daily life of newspaper and magazine workers most of whom, long inured to economic depressions, the melancholy fellowship of financial stringencies, think of the trio as very important items of existence as indispensable as bread and butter, ham and eggs, a cup of good coffee or, for the Englishman, a dish of tea and a biscuit. Kindred joys that warm the heart.

Otto says these three American foods were run out of the diners by foreign cookery. Mebbe so, but we have no remembrance of ever meeting corned beef and cabbage in a diner. Neither can we think at the moment of any foreign confection so unbelievably alluring, so soul and stomach satisfying, as a plate of this delectable combination, a perfect union if ever one existed. Switchmen call it Jiggs, thus testifying to its plebeian origin. New England boiled dinner never has created the same gustatory reflections. It has never had the same power to cheer the downcast heart. We have always thought the name fitted the dish admirably—New England—cold, unemotional, lacking always that gracious warmth and coziness associated in the mind of the real gourmet with Jiggs and Irish stew. We do hope Otto hasn't been spoofing us. Serve corned beef and cabbage and Irish stew regularly, and it may be possible to wipe out some of the annual deficit created by dining cars.

By Rail 3.6 Cents

According to the department of commerce the average price for air passenger service in the first half of 1927 was 13 cents a mile for a passenger.

Following a survey of commercial aeronautical activities of American companies for the first six months of the year the government announced that 395,646 passengers were carried.

Without Due Compensation

The Atlantic Coast Line, judging from facts now at hand, was within its rights in abandoning and tearing up its branch from Yustee flag station to Monticello, Fla. Of course this drastic action was not resorted to without the advice of the company's legal counsel. When private property, used for the public's convenience and comfort, fails to pay ex-

penses no deep knowledge of the law is required to understand that the owners may cease to let the public use it, despite the orders of state and federal commissions to the contrary. None of these bodies, and no state law, is superior to the old reliable United States Constitution. The wonder and the pity of it is that so few railroad companies take advantage of this fact. Instead of arguing with commissioners who know nothing about the Constitution, apparently, the railroad company in this instance, removed the tracks, thus shutting off the cause of argument. Somewhat British, but certainly extremely effective.

Not Much Water Here

The investment of the railroads exceeds their net capitalization outstanding in the hands of the public at present by more than four billion dollars. This fact is brought out statistically in reports supplied by the Interstate Commerce Commission.

The commission's figures show that the net capitalization of all the railroads, with the exception of switching and terminal companies, was, in round numbers, 18 billion 200 million dollars in 1925. By "net capitalization" is meant the total amount of railway securities, stocks and bonds outstanding in the hands of the public. The railway securities held by railways are not included.

In the language of the Interstate Commerce Commission, "$18,190,513,329, or $74,460 per mile of road, is the net sum which would be necessary to purchase these railways, considered as one system, on the basis of the par value of their stocks and bonds not held under railway ownership."

The investment in road and equipment, on December 31, 1925, of the railroads amounted to $22,-736,993,054, a total more than four billion dollars greater than their net capitalization. How can any sensible, fair minded man justify the cry of "watered stock?"

A Valuable Bureau

The precise effect of freight rates on prices of commodities is losing its old standing as a favorite topic for orators of a certain class, and credit for the change in fashions for gabblers belongs to the bureau of railway economics in Washington. If this bureau never did another thing the surveys it has made showing the spread in prices compared with freight rates would justify every dollar spent for its maintenance. No other economic information has been prepared so intelligently. The bureau's latest survey has to do with oranges in Florida and California. The figures are enlightening. Let us hope they may be digested by the Interstate Commerce Commission.

These figures show that the average price of $5.14 a box for Florida oranges in New York was 44 cents more than in Boston and 48 cents more than at Philadelphia. It also was 50 cents more than at Chicago. The average price in New York of California oranges during the season was $5.08 a box, which was 21 cents, 23 cents, and 18 cents, respectively, greater than the average prices at Boston, Philadelphia, and Chicago.

The seasonal spread in the wholesale price of Florida oranges was nearly 11 times the highest freight rate to New York, Boston, Philadelphia or Chicago, while the seasonal spread on California oranges was over 14 times the highest freight rate to any of those markets. Since freight rates on oranges remained stable, the causes for these violent price changes must be sought among other economic factors of distribution.

The monthly range, according to the study, in retail prices of oranges was generally pronounced, the differences between the lowest and the highest prices frequently being from one to three times the lowest price. On a per dozen basis at New York, these spreads were sometimes as much as the freight rate on a whole box of oranges from shipping point to market. On a box basis, the spreads in retail prices frequently were many times the freight rate from shipping point to market.

The Elastic Day

The elastic day, sponsored by L. F. Loree, of the D & H, investigated by the Association of Railway Executives, and then recommended as an ideal stabilizer of labor, seems to be going over properly. The latest advocate is the Cheasapeake & Ohio which issues a bulletin describing its experiences as satisfactory.

All the carriers have suffered for years from constant changes in their forces, necessary shut downs, temporary need for larger numbers of men. The C & O has found, just as the report to the railway executives points out, that stability of employment goes hand in hand with adequate earning power; that when income is irregular and the rate of return on the investment is low, then the average hours of service of railroad employes also are irregular; but that as the earnings improve, the employment conditions improve also. A careful study of conditions on the C & O and an analysis of causes have resulted in little variation in the employment forces.

Whistling Away the Friends

Someone said a while ago that the engineer who used his whistle most frequently had the fewest accidents. May be so. But he has also the fewest friends. He makes enemies for the railroad employing him. Every time he obeys the rules calling for

whistling at certain points he makes some tired person wish he and the road were at the bottom of the sea. Everyone who has paid any attention to the matter knows some engineers whistle away about twice as much steams as others, and this ought to be forbidden. About the most expensive toot an engineer has is the whistle. It costs at lease 25 cents every time it is sounded.

Touching on this subject recently, the monthly bulletin of the Southern Pacific said, editorially: "The light sleeper, the father who has just lulled his infant to sleep after wearing a path in the carpet; the swain who is trying to catch a few winks of sleep before sunrise and the beginning of a hard day at the office; the sick person trying to steal a few hours of rest from pain—all have a grievance when the locomotive whistle is sounded too long and too vigorously. And a grievance in the middle of the night assumes larger proportions than a grievance in the daytime. It is a characteristic of people who work at night that they forget that most of the world is sleeping—or trying to sleep."

Good Work On the Wabash

Master mechanics and executives everywhere are certain to be interested in the report of the very fine record just reported by the Peru and Detroit divisions of the Wabash Railway. F. W. Rhuark, the division master mechanic, has something over which to be pleased, especially as such records prove the existence of real cooperation on the road, and without this they would be impossible.

The Detroit division of this railroad has not had a passenger engine failure in six months, making 339,287 miles per engine failure. That division has gone for four months without a failure either in passenger or freight service, making a combined mileage of 1,178,957. It had but two passenger, and only four freight failures in the entire year.

On the Peru division, in four months, there was not one passenger failure, making 277,286 miles, and one failure in four months in freight service, making a combined mileage of over one million miles per engine failure on these divisions. The Wabash averages a little better than 67,000 miles a month in passenger service, and about 142,000 in freight service on the Peru division. The Detroit division makes an average of about 68,000 miles in passenger service and 229,000 miles in freight.

Due to its water treating system the Wabash has had no failure in five years due to leaky flues or leaks in fire boxes. It is running its engines four years on flues, and in some instances gets an extension of six months before renewing them.

Obviously this fine showing is due to good water conditions and close supervision in regard to repairs to locomotives. The road gets 100,000 miles on passenger engines between shopping and 60,000 on freight power. The system of figuring mileage on locomotives on the Wabash starts and stops on any class of repairs. This is different than on the majority of roads. Any detention on passenger power of five minutes and 20 minutes on freight is considered an engine failure on the Wabash.

And This Is the 20th Century

It seems almost impossible in this day and age to accept the story the writer heard the other day from a railroad official of good repute. His road, he said, had recently decided to go after the question of fuel economy. After planning the program one of the first things done was to survey the condition of power in operation. None of the engines was of modern vintage, so the mechanical department decided the first essential step was to install superheaters. After a few engines had been equipped,—and bear in mind the president had suggested the fuel campaign to reduce expense—he issued an order that no more engines were to be equipped with superheaters, as his company, under existing conditions, could not afford further capital expenditures. This, despite the fact that the first engines equipped already had demonstrated that the savings effected would pay for the superheaters in a very few months.

We wonder what economical cooperation such a man can expect from the employes of his road when he, on the one hand, demands efficiency and economy, and on the other, refuses to allow the most ordinary expenditures to achieve it?

This is Pretty Bad

Reports that 5,000 Indians had been run into Tucson one day last month in charge of one lone white man caused some excitement, according to the veracious press agents of the Southern Pacific. A train dispatcher at El Paso declared this was the report as he received it. Careful investigation developed that the "Indians" referred to were, in fact, "Injuns" or, if you are still reading this, "engines." And now you see the fine Italian hand of the press agent at his best or worst, trying to tell the waiting world that the company had just received at Tucson two of the new 5000 series Southern Pacific type, three-cylinder locomotives, "the most powerful single unit railroad 'engines' ever built." There was more of it, but this will do.

Speaking of income, which usually we are, the average man finds it as difficult to live on $10,000 as on $2,000 a year. The degree of real happiness we reach depends entirely on ourselves—not on our incomes.

What They're Saying in Washington

Congress and Consolidations

By W. E. Hopkins

THE National Industrial Traffic League, through a committee which called at the White House September 22, urged President Coolidge to recommend in his annual message the desirability of congress remodeling the existing law so that natural, voluntary consolidation of the railroad systems may be effected without further delay. The existing law, it was understood to have been pointed out to the chief executive, requires a permanent plan of consolidation and is too obstructive to that end.

The league was represented by R. C. Fulbright of Houston, Texas; J. H. Beek, secretary, and C. E. Child of Omaha. These gentlemen believe broader powers should be given the Interstate Commerce Commission to approve consolidations where these may be brought about without lessening competition, and where the rights of minority stockholders are protected.

It is understood the President was assured that the shippers generally were favorably inclined to the Parker bill as introduced at the last session of congress by Chairman Parker of the house interstate and foreign commerce committee. Some changes will be necessary, it was said, in order to bring about practically complete approval, but for the most part these are of a minor character.

In view of the fact that President Coolidge has, in several previous messages, urged congress to modify the existing consolidation provisions of the Transportation Act of 1920, it is generally believed that such recommendations as he may see fit to make to the congress which will convene early

in December will be largely along the lines previously made by him.

That the subject of railroad consolidations will hold an important place at the coming session seems almost assured. Indication is that every effort will be made by supporters of the Parker bill to push that measure in the house, and while no definite announcement has so far been made, it is the understanding that Chairman Parker contemplates holding hearings on his bill some time prior to the actual reconvening of congress.

At the last session of congress, Senator Fess, Republican of Ohio, introduced a bill practically identical with the Parker bill, and it is generally believed he will do so again. Hearings on the subject are expected to be conducted by the senate committee although it probably will not be as extensive as those in the house for the reason there is a general feeling among the members of the upper body that they are thoroughly familiar with the subject and no one can offer any new ideas to them.

It has just been learned here, however, that Senator Brookhart of Iowa is preparing a bill providing for consolidation of the various railroad systems and he has told friends that he plans to ask for early hearings on it. His bill differs radically from the Parker and Fess bills, however. He would authorize a federal board or commission to acquire the railroad properties through condemnation proceedings if not possible otherwise, thus bringing the roads under government ownership. As has been repeatedly contended by him, the valuation tentatively fixed by the Interstate Commerce Commission is excessive, and in his bill he would seek to bring about a radical reduction in valuation. Furthermore, the Iowa senator proposes to fix freight rates on the basis of the price of various farm commodities principally, at least so that every advantage would be given to the agricultural interests and without regard for the cost of transportation.

There is considered to be scarcely a chance for such a bill as it is understood Senator Brookhart will propose to receive even serious consideration but at any rate it will provide the vehicle for extensive debate, particularly on the part of the so-called "radical group" in the senate.

On nearly 60 per cent of the railroad mileage of the country trains are being operated by means of telephones. This is shown in a report just made public by the Interstate Commerce Commission based on reports obtained by that body from the various railroads.

The growth in the use of the telephone as a means of operating trains has been nothing short of marvelous since the war, that means of communicating rapidly displacing the telegraph.

Out of a total of 257,033 miles of road, the reports to the commission show that 143,374 miles are operated by telephone and 113,659 by telegraph. On January 1, 1920, miles operated by telephone totaled only 119,554 while 134,667 miles were operated by telegraph. This means an increase of nearly 20 per cent in the mileage operated by telephone in seven years.

After the usual summer lull, the Interstate Commerce Commission has renewed activities with many hearings scheduled for the coming winter. The year seems likely to be a busy one for the commission which has a number of important cases pending before it, the most important probably being the Chesapeake & Ohio consolidation case. So far there has been no intimation as to when a decision can be expected in that matter but persons familiar with the workings of that body hardly expect any development before the first of the year at the earliest.

The commission has approved proposals of the New York, New Haven & Hartford to issue $4,036,700 of cumulative 7 per cent preferred stock and a similar amount of common stock as part of the plan of that road for discharging its indebtedness to the federal government growing out of the war. It is proposed by the company to offer 490,367 shares of preferred with a par value of $100 for subscription to common stockholders at the rate of one share of preferred for four of common.

The commission in its report, however, refused to sanction plans whereby J. P. Morgan & Co. would underwrite the issue for a commission of 2 per cent which would amount to a total cost of $980,734. The commission took the position that the expense was unjustified.

Hearings have been opened by the commission on the application of the Pittsburgh & West Virginia R. R. to construct a new link of 38 miles between Connellsville and Cochrane Hill, Pa., in order to provide a connection with the Western Maryland. The cost would be $15,000,000.

F. E. Taplin, chairman of the board of the Pittsburgh & West Virginia, told the commission the proposal was made after the major trunk lines had refused to enter into traffic agreements in order to enable his road to route traffic over existing lines.

The commission has placed a tentative value in excess of $282,000,000 on the properties of the Erie Railroad Co., according to a report just made public by that body. Property owned by the road is worth $172,026,148, the commission found, and total property used by the carrier is valued at $282,390,001. These two figures represent, the report held, what the Erie and its subsidiaries were worth for rate making purposes on June 30, 1918.

Persistent reports that Commissioner Hall will shortly resign from the Interstate Commerce Commission are current in Washington. When asked about the reports this week, Mr. Hall showed a brief statement which he had issued as a result of inquiries from various newspapers in Colorado, his home state, to the effect that he had not resigned but that he had nothing further to say for publication.

Whether Mr. Hall has definitely decided to retire from the commission but is withholding an announcement in order to give the President an opportunity to select a successor and make the announcement himself at the White House can not be ascertained but the reports are so persistent that the assumption in Washington is there must be some basis for them.

Retirement from the commission of Mr. Hall would mean a real loss to that body for the reason he is an authority on railroad consolidation matters. He also is a man of wide experience and is one of the most valuable men on the commission.

An aspirant for Mr. Hall's job in the event he does resign has already had his hat tossed into the ring. That person is Chairman Betts of the Arizona state commission. Owing to the size of the public domain and the vast expanse of the Coolidge front yard where the ring is situated, an elaborate display of headgear is expected to be deposited there in the event Mr. Hall does quit. In view of the recent summer vacation in the West, President Coolidge undoubtedly will not attempt to dodge many of the ten-gallon variety which may come hurtling over the iron fence.

But His Name Lives Forever

Every one who has ever tried to do anything of consequence has doubtless had setbacks and discouragements. In such circumstances, the earlier experience of Lincoln is a good thing to remember.

It has been written of him that he went into the Black Hawk war a captain and came out a private. His store failed; and his surveyor's compass and chain, with which he was earning a poor living, were sold for debt. He was defeated in his first campaign for the legislature; defeated in his first attempt to be nominated for congress; defeated in his application to be appointed commissioner of the general land office; defeated for the senate in the Illinois legislature of 1858 by an antiquated apportionment; defeated for the nomination for vice-president on the Fremont ticket in 1856.

Yet Lincoln's work is one of the outstanding examples in all history of personal success.

Flying Safe and Sane, the Wright Brothers' Goal

Orville Wright at Center of Plane. Wilbur Wright at Front Edge of Wing, Fort Myer Flights, June, 1909. Note the Chain Drive to Propeller, the Starting Rail, Front Elevator, and Large Radiator Partly Obscuring the Engine.

By

H. H. Arnold

Major, U. S. Army Air Corps

"And still he flies away—away; it seems
the merest fun;
No marvel he is getting bold and
aiming at the sun;
No marvel he forgets his sire; it isn't
very odd,
That one so far above the earth
should think himself a god."

What manner of men are these,
Who risk their lives their pride to
please?

WILL man with his mechanical devices ever keep pace with the sun as it races around the world? In the first successful airplane flight at Kitty Hawk in 1903, Wilbur Wright flew at the rate of 40 miles an hour. Since that time the speed of airplanes has increased steadily until now, 23 years later, planes have attained a speed of almost 300 miles an hour. This tremendous rate of 440 feet every second is so great that planes making it could run away from cannonballs shot at them by the old Civil War guns.

Al. Williams, one time ball pitcher for the New York Giants, and now a naval aviator, piloted his plane in 1925, at Mitchell Field, Long Island, over a measured course at a speed slightly over 300 miles an hour, but he had a favoring wind. The ultimate speed is not yet in sight, for designers even now have planes on their boards which they hope will far exceed the 300 mile rate.

Scientists, doctors, psychologists, engineers and aviators are studying the subject with a view of determining the ultimate speed of the airplane. Each has his own ideas concerning the factor that will govern the speed limit. Scientists predict there is a force which no increase of power or refinement of planes will be able to overcome—the great resistance created by the air. Doctors advance the theory that the limit practically has been reached now, and any radical increase will produce strains on parts of the aviators' bodies causing them to lose consciousness, and thus the plane will fall out of control. Engineers, at first inclined to be conservative, now say they can produce planes with increased speed as long as aviators can be found to fly them. The average aviator will fly anything in which he thinks he has an even chance for his life. As one aviator said, when asked if he would fly a certain plane, "It has wings and an engine, hasn't it? Of course I will fly it!"

Man has always been seeking speed. The ancients dreamed and wrote of winged horses and chariots, but modern man produced them. The myths and dreams of our forefathers were a perfectly safe pastime, but the fulfillment of those dreams has caused the sacrifice of many lives. With increased speed come greater hazard and risk. This is perhaps truer in aviation than in any other mode of transportation, but volunteers to compete for speed are never lacking. There is a thrill, a feeling of superiority, a spirit of absolute freedom known only to the aviator as he flies in his plane bound by none of the rules of travel on the earth. He goes where he pleases, has supreme confidence in his own ability, and travels through the air with a feeling of absolute security. He has ceased to be an earth-bound human.

The aerial speed kings have come from all walks of life. Bicycle and motorcycle manufac-

This is the first of three articles describing the development of aviation. The second article will be published in November.

Wright Glider Overturning, Due to Strong Wind Gust. Orville Wright in the Glider at Kitty Hawk, N. C.

turers, trick bicycle riders, school boys, circus performers and automobile mechanics have all contributed their quota. Harry Houdini, the late handcuff king, and one of the world's magicians, was one of the speed champions of the air. He defeated all comers in 1910 in a race for the aerial speed crown of Australia.

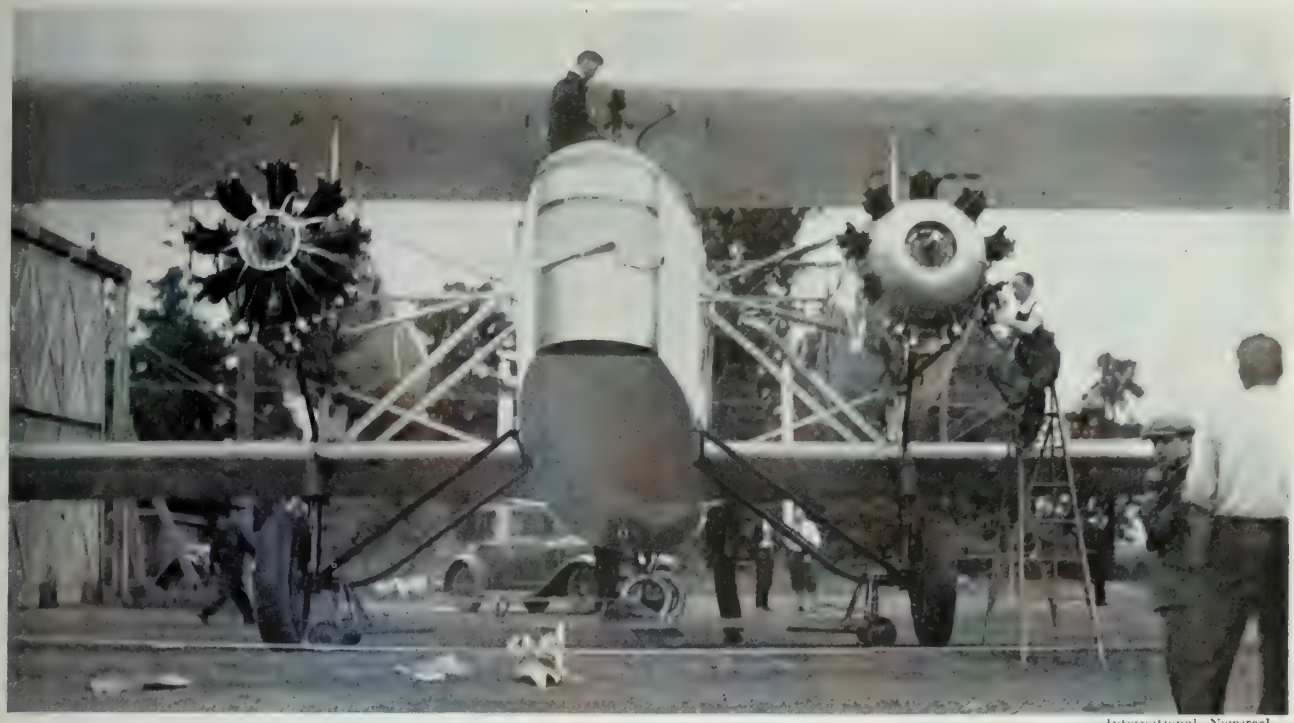
The Wright Brothers were satisfied with producing a means of safe aerial travel. Speed was a secondary consideration, needed only to sustain the plane in flight. Hence, prior to 1909, there was no such thing as an airplane race. As others built planes that flew, the desire for competition made itself felt, and with such a desire came the demand for aerial records. However, to Wilbur and Orville Wright went the honors of being the first aerial speed kings.

The public was not satisfied with reading about flying machines. It wanted to see them, and was willing to pay for the thrill accompanying the first view of a man-made machine flying through space. Other companies were sending exhibition teams out on the road, and of necessity the Wrights had to fall into line. Their team had not received the finishing touches in its training when the aerial meet at Indianapolis opened in 1910. One after another of the team went into the air, did his particular stunt and made a safe landing. The crowd, to get its money's worth, was staying on, although darkness was coming. The last flight scheduled was to be made by a Frenchman named La Chapelle. He left the ground, and after flying around a bit came in to make his landing. Just as the skids of the plane—there were no wheels in those days—were about to touch the ground, he gave his engine full throttle and started up again. Meanwhile it was getting darker, and there was much anxiety as to La Chapelle's ability to land the plane safely. Wilbur Wright showed his nervousness by pacing back and forth. Several times La Chapelle repeated the maneuver and went into the air again. Then, when it had become quite dark and everyone had given up all hope of the man's ever getting down safely, he made a perfect landing. Wilbur then went up to him and asked, "What's the matter? Did you run out of gasoline?", a characteristic example of sarcastic wit of the first aerial speed king.

As the Wright's planes were built for safe and sane flying it was only natural that some one else should come along and take the speed records. Glenn Curtiss, a motorcycle manufacturer, had been spending his idle moments thinking of that new mode of transportation through the air. Curtiss always had been a speed fiend, never satisfied unless he could travel faster than anyone else. In 1907, to demonstrate that existing motorcycle records were not as fast as they should be, he installed an eight-cylinder engine in a new motorcycle and covered a mile in 26 2/5 seconds, at Ormond Beach. For years this record withstood all attempts to smash it.

Soon after the first successful airplane flight had been made, in 1903, Curtiss started to build a plane. His labors were rewarded by his winning the first recognized international airplane speed race, the Gordon Bennett cup race. Curtiss went to France to compete in that race practically unheralded. He unpacked his plane, crude in construction and not much for looks, at Rheims. After looking over his outfit, the foreign contestants did not even consider him a serious rival. Among other things they considered his flying costume was against him, for, while they were attired in trick garments selected by foreign dictates as being the proper thing to wear, Curtiss appeared in his regular street clothes. When the starter gave the signal for him to start, he turned his cap backward, jumped into his plane and was off. His take-off was characteristic of the man.

The Airplane Which Won the First Gordon Bennett Race in 1909. Curtiss Built This Plane, and Flew It in the Race.



International Newsreel.

The New Sikorsky Plane Built for Rene Fonck at Curtiss Field. Fonck is the Gentleman Who Crashed When He Made His First Attempt to Take Off for Paris a Few Months Ago.

There was something to be done and he did it in the easiest and simplest way. Curtiss won that race with a speed of 47 miles an hour.

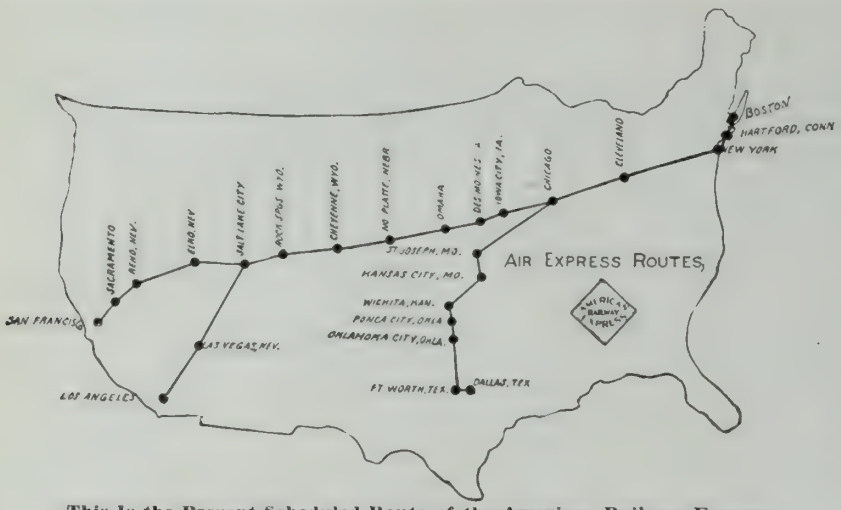
The planes used at that time might well have been called motorized box kites. The aviators sat between the upper and lower wings exposed to the wind blast. There were no instruments to foretell motor trouble or to assist the pilot in navigating. The successful termination of the flight depended almost entirely upon the pilot's ability. Even in those early days the necessity for an altimeter was apparent, however, for when Wilbur Wright made the first altitude record, he was required to fly over several captive balloons anchored by a cable exactly 300 meters long.

Since man learned to fly there may be said to have been three types of aviators competing for the speed crown. First, the Wright and Curtiss type, inventors demonstrating their planes to insure their acceptance as an efficient and rapid means of transportation. Second, the aerial adventurers, paid for showing their skill and daring. On account of their utter lack of fear, and supreme confidence in their own ability, nearly all this class passed out early in airplane crashes. Third, the army and navy officers who have carried on the endless race between time and distance since the World War. These men consider it a part of their duty in the development of aircraft for military purposes.

The majority of airmen of the second group had come from occupations the success of which depended upon their ability to provide sensations and thrills for a crowd. Thus the trick bicycle riders, circus acrobats, trapeze artists and parachute jumpers found a new means of providing thrills not only for themselves but also for the spectators. Flying aircraft at that time was very precarious business, but the development of the airplane would have been greatly retarded had not these fearless men demonstrated the capabilities and performances of the types then existing.

One of the rules of the Gordon Bennett race was that the nationality of the winner determined the country in which the following race should be held. Accordingly the contest in 1910 was held at Belmont Park, L. I. The retention of the cup in the United States depended first, upon the ability of our manufacturers to produce planes equal in performance to those representing foreign contestants, and second, the prowess of our pilots. There were several aviators of note, prominent on account of their record breaking flights, who were ready and willing to compete against the best European pilots.

Probably the best known of the American aviators was Charles K. Hamilton. Early in 1904 Hamilton had tired of the prosaic method of waiting for a strong wind to bear him aloft from a hill, and substituted different forms of motive power to keep him sustained in the air. At first a horse pulled the glider, then an automobile and finally a motor boat. His next step forward in aeronautics was to obtain a non-rigid airship in which he toured this country and then the Far East. Hamilton then started flying planes, and in 1910 won the round trip New York-Philadelphia race. This was a most



This Is the Present Scheduled Route of the American Railway Express Company's Air Service.

remarkable performance in that he completed the race the day it started and made an average speed of 50 miles an hour for the trip.

Hamilton became famous for his daring aerial stunts, his flying after dark and his absolute lack of fear. It has been said Hamilton had more accidents than any other pilot. He admitted that every major bone in his body had been broken at least once and some of them twice, but kept on with his flying. There was a touch of the unexpected and dramatic in this man's crashes. On one occasion he became confused with the controls of a new type of plane and fell into a thorn tree. The mechanics and spectators present rushed toward the wreck assured that he was badly hurt if not killed. As they approached the scene they were startled to hear him cry, "For God's sake get this engine off my neck." They found him with a 200-pound engine resting upon the base of his skull, a few broken bones, but otherwise all right.

Another aviator of whom great things were expected was Walter Brookins. Brookins started flying at the age of 17 and was known as the "School Boy Aviator." Although young, he was a natural flyer and had many records to his credit. At Atlantic City, in 1910, he achieved the honor of being the first man in the world to take a plane a mile high. Then again, he had made a complete turn, 360 degrees, in his plane in 6 2/5 seconds. In any aerial events that required special skill Brookins could be expected to come out near the top. Brookins enjoyed flying and the notoriety which accompanied it.

Another of the top notchers was Arch Hoxey, the gentleman aviator. In mild weather he always flew his plane attired in a blue coat, white flannel trousers and white shoes, much to the disgust of the other aviators. How he managed to keep his clothes immaculate with all of the grease, oil and dirt present was and still is a mystery. His rise to fame came with a world's record non-stop flight from Springfield, Ill., to Clayton, Mo., a distance of 89 miles. Later, upon arriving at St. Louis he had the distinction of taking ex-President Roosevelt for a ride in his plane.

Hoxey's team-mate was Ralph Johnstone. Johnstone had given up trick bicycle riding in vaudeville to take up flying. He was the super-stunt pilot of his day. His steep banks, roller coaster, falling leaf and tight spirals were at the time the ultimate in stunt flying, and finally caused his death in Denver. Johnstone and Hoxey spent their idle moments in breaking the altitude records until they became known as the "Heavenly Twins." They were afraid of nothing, and seemed to delight in flying when, on account of the heavy wind, other aviators would not leave the ground.

Johnstone and Hoxey were the first men to move backward over the ground in airplanes when they were doing their best to move forward. The planes they used had a maximum speed of about 45 miles an hour. They had gone up after another altitude record and had reached an altitude of about 500 feet. Here the wind velocity was the same as the speed of their planes and they stood motionless over the ground. As they climbed higher the wind became stronger, and the two planes moved slowly backward. Johnstone and Hoxey continued their upward flight until both had reached a point above the then existing record. By that time both planes had drifted backward several miles from their starting point, and the spectators were much concerned as to how the "Heavenly Twins" would get back to the flying field. Both tried to make a landing on the airdrome, but Hoxey landed about four miles away and Johnstone about 50 miles. Thus it was that these two men had the unique distinction of leaving the ground, climbing to an altitude above 7000 feet and landing at points to the rear of their direction of flight without turning their planes.

(To be continued)

The New Air Express

The newly established coast-to-coast air service of the American Railway Express Co., described in this magazine in August is succeeding. Business firms were quick at both sides of the country to use the planes for everything requiring speed. T. A. Woods, general agent, believes the new service will create a traffic all its own. The present routes include the airways of the Colonial, National and Boeing Air Transport Companies and the Western Air Express. The routes extend between Boston and

Officials of the American Railway Express Co., Helping to Load the First Air Express, Including Some Perishables, for the East. The Service Began to Function September 1.

New York; New York and Chicago; Chicago and Dallas; Chicago and San Francisco and Salt Lake City and Los Angeles. The coast-to-coast trip eastward is made in 32½ hours and westward in 34½ hours.

"Our use of aviation was not hastily conceived," said Mr. Woods. "Robert E. M. Cowie, president, has been a student of air transport for the last decade. Eight years ago, he brought about a trial flight for carrying express between New York and Chicago. He has since been waiting until dependable air transport schedules could be depended upon and feels that the 'psychological moment' is here.

"In fact, the contract with the National Air Transport was executed last November and that was long before public interest in aviation was aroused by the amazing transatlantic flights of Lindbergh, Chamberlin and Byrd. But necessarily we had to wait until the New York-Chicago leg of the transcontinental route was turned over to private operation by the government, as it was on the first of September.

"It is only 88 years since express service began on the lumbering stage coach, the only means of transportation before the railroad. In that era, the trip from the Missouri River to the Pacific Coast took two weeks. The famous Pony Express shortened the stage coach time by six days. The railroad brought the transcontinental time down to four days and now the airplane reduces it to two."

While express traffic of almost every kind can be sent by air express, there are, naturally, restrictions in weight and bulk, governed largely by the physical limitations of the planes themselves. No shipment of over 200 pounds or over $5,000 in value will be accepted. Live creatures can not be forwarded, and explosives or highly inflammable matter is ruled out. Shipments of unusual bulk can be forwarded only under special arrangement, the limit being 106 inches in length and girth. Over 60 inches in height and 19 inches in width are beyond the capacity of planes. Packages over 40 inches in length must not be over 4 inches in depth.

Tariffs covering the air express service are calculated in cents per quarter of pound, the minimum being from $1 to $3.20, according to the distance to be shipped. Fifty cubic inches of space is the maximum allowed for each quarter pound or four ounces of actual weight, or 200 cubic inches for each pound.

On air express packages the carrier assumes its usual liability as applied to rail express, excess value charges at the rate of 15 cents being charged for each $100 or fraction of valuation in excess of $50 for any shipment of 100 pounds or less or 50 cents a pound for a shipment over 100 pounds. C. O. D. service will also be performed on air express shipments.

Railroads Help Aviators

The names of towns, the mileages and direction to Candler Field, will be painted in distinctive lettering on the roofs of all depots of the Georgia Railroad, the Atlanta & West Point and the Western Railway of Alabama, to aid aviators flying across Georgia.

On the roof of each depot, the name of the town will be painted in letters eight feet high, probably in orange or yellow on a dark background, which has been found most effective. Arrows and mileage figures will also be given.

Dividend by Western Air Express

A 2 per cent dividend to stockholders of record September 15 was distributed by Western Air Express, Inc., October 1, according to action of the air carrier's board of directors, announced by Harris M. Hanshue, president and general manager.

This is said to be the first instance in aeronautical history where an air transport company engaged solely in commercial operation of airplanes and dependent upon earned revenue for its entire income, has paid its stockholders a return from surplus upon their investment.

Western Air Express, Inc., carrying nearly 40 per cent of American air mail in its planes between Los Angeles and Salt Lake City daily, is reputed to be the world's first economically successful venture in air commerce. Its planes have flown an aggregate of more than 660,000 miles.

Lindbergh Against Ocean Ban

Col. Charles A. Lindbergh says in a public statement that he considers regular transoceanic travel by air is no more practical today than transcontinental air lines were a decade and a half ago. Years of development and scientific research will be required before such regular inter-continental service can be successfully inaugurated. The statement continues:

"During this experimental period we may expect casualties, yet to totally restrict hazardous flights would have the same effect on the future of transoceanic flying as the air-mail would have experienced had it been abandoned by the government during the heavy casualty period of its pioneering days.

"The result of total restriction might be compared to the effect on aviation in general had legislation been enacted against all flying during the first few years following the flight of the Wright brothers, when hour for hour, any flight was more dangerous than transoceanic flying is at present.

"The pioneering and development of almost every advance in the air is marked by the loss of its explorers or its scientists. Yet they would be the last to request that the advancement of the cause for which they gave their lives be retarded.

"Hazardous flights should not be prohibited, but they should be attempted only after careful study by experienced personnel with the best of modern equipment and for a definite purpose. In the future expeditions should be organized and prizes offered under conditions which promote the development of safer travel.

"Safety of travel does not rest alone in the perfection of plane and engine, but equally important is a highly trained personnel, accurate weather information, and other navigational aids, including a means of radio communication for use in case of forced landing."

The Steward on A London-to-Paris Air Liner Serves Things to the Travelers, Most of Whom Seem to Be Women. The Tall Bottle May Be Mineral Water, But the Short One—We Suspect It.

Airway Transport Notes

Plans and specifications are now in course of preparation the department of commerce, aeronautics branch, reports, so that proposals will be issued shortly for 27 beacons and two intermediate fields covering about 270 miles of airway from New York to Richmond, on the Atlanta-New York airway, about 24 beacons and seven intermediate fields covering 234 miles on the Boise-Pasco section of the Salt Lake-Pasco airway and about 32 beacons and eight intermediate fields covering 400 miles of airway from Los Angeles to San Francisco on the Los Angeles-Seattle airway.

Little Stories About Big Men

At the

Daniel Willard, President, Baltimore & Ohio; Albert C. Ritchie, Governor of Maryland; John G. Sargent, Attorney General of the United States; Wm. F. Broening, Mayor of Baltimore.

Fair of the Iron Horse

IF YOU took part in amateur theatricals when you were a youngster, or, later in life, helped in arranging exhibits in the county fair in your home town, you can qualify as a competent witness testifying to the mighty job that faced the officials of the Baltimore & Ohio in "The Fair of the Iron Horse." If you've never been anything but a spectator the rules of evidence bar you. You don't know anything about it. No one on earth has the slightest conception of just what such labors mean unless he has been through it himself, and few of the well known intelligentsia can put on such work the proper price-mark. Not even the Interstate Commerce Commission could place the right value on this great exposition. Most of the equipment was pretty old, you see, and this would mean a row about depreciation, cost of reproduction new, and such things. And of course there would be a minority report.

It was a most wonderful exposition, marvelously conceived by these railroad officers, its myriad details executed with clock-like exactitude. Very wonderful, but by far the most unusual feature of the whole affair was the fact that, contrary to every known precedent, the thing was ready on time. Like a B & O passenger train, it started at the advertised instant, and it went right along smoothly as those trains do, without hitch, without confusion, a great accomplishment. If any reader of this department remembers a similar instance, large or small, and can prove it, he wins the self-filling butter dish.

No man or woman in the B & O family, during the two years or more that this fair has been in process of planning and construction, apparently ever has thought himself too small or too big to do everything possible in his power, day or night, to make it a success. Reasoning persons will, of course, realize the immense responsibility resting upon the shoulders of the B & O officials. Think of the almost priceless exhibits entrusted to their care by interests in many parts of the nation, and by others abroad! It was because these exhibits were treasures never to be replaced if destroyed that the buildings that sheltered them were of fireproof materials, brick and steel. Baltimore is a big city. The management of the fair knew its thousands of loyal citizens would be inside the reservation, and that to these throngs would be added many other thousands from every part of the country, and even from across the seas. In fact the attendance the second day, when there was no pageant, far exceeded that at the opening, numbering more than 55,000. Think of a private corporation and its employes handling such masses, the danger of accidents, the possibility that people might be injured where so much working equipment was in operation—imagine the responsibility, if you can—getting the crowds safely through the stations to the grounds, protecting them in

George M. Shriver, Senior Vice President

crossing tracks with exhibits moving back and forth: a tremendous job, this, being host to the world!

They looked tired and worried, too, these officials, but no visitor saw or heard any evidence of their indisposition. From the start to the finish of their great party these gentlemen were as unfailingly good tempered, patient, courteous, eager to please as a real estate salesman in—well, in Florida, for instance. Within the memory of this reviewer no corporation ever put on such a good-will show in America, if anywhere, a perfectly amazing piece of public relations work not likely soon to be surpassed.

But what might one expect from such men as these? The president of the Baltimore & Ohio, four vice presidents, and the secretary of the company, none of the group with less than 40 years' experience in railroad service! Such a life teaches men the right measure of big affairs, the handling of large enterprises, the tact and perseverance needed in moving great numbers of human beings.

Heading this fine aggregation was Daniel Willard, the president of the Baltimore & Ohio. Eastern newspapers will tell you this gentleman began his railroad career 48 years ago "with the maintenance of way forces," of the Central Vermont Railroad. But when you get behind this kind of bushwah, as the frank and human Daniel Willard loves to do, you discover it means that he began as a section hand. Probably at that time he didn't know there was such a thing as "maintenance of way forces." Few railroad men have had such complete training as Mr. Willard, and none has come through such experiences more affable, kindly, careful of the many little courtesies that make life worth while. The result of his training was shown when, the day before the opening of the exposition, he was seen tramping around through the grounds and buildings examining the largest and the smallest of the overwhelming maze of displays.

Did you ever hear Vice President George M. Shriver testify before the Interstate Commerce Commission, a carload of "exhibits" surrounding him as he tried to make the members of that body understand a few of the intricacies of transportation and the finances appertaining thereto? If you did you can imagine the help he gave to this exposition, and you will have no difficulty in estimating the joy he experienced in the presence of such a whale of a lot of exhibits. Mr. Shriver started with the B & O as a clerk in 1886 in Baltimore, in the accounting department. Later he served as secretary to three successive presidents of the company, assistant to three, and now is the senior vice president. He it is who has the ineffable delight of arranging the company's financial affairs, another grave responsibility in these days of disappearing net returns.

William Galloway, who ran the first locomotive over the Baltimore & Ohio, and probably was the oldest engineer in the world, died in April, 1890, after more than 50 years' service. He was 81 years old. Mr. Galloway began his railroad life driving a horse car on the B & O in January, 1833, when he was 24. Soon he became what was then called a dispatcher at Mount Clair station, when horses still supplied the motive power. When locomotives were adopted he was chosen to be the first engineer. The run was from Baltimore to Ellicott City, and the locomotive was a "crab" engine. Afterward, when the B & O completed its tracks from Washington to Baltimore, Galloway was put in charge of Lafayette engine No. 13, and made regular trips to the national capital. Mr. Galloway ran between Baltimore and Washington for 46 years. He averaged 16 trips a week, and in that time made about 38,272 trips. Each trip being 46 miles in length, he traveled over 1,530,880 miles. He is credited with having but two accidents while in the engine cab.

It seems peculiarly fitting at this time of celebration to include mention in this department of one of the Baltimore & Ohio's big men, for to whom could this title better be applied than to the man who started the mechanical history of that great railroad? Mr. Galloway was the grandfather of C. W. Galloway, now vice president of the B & O in charge of operation and maintenance.

C. W. Galloway, Vice President

F. C. Batchelder, vice president of the Baltimore & Ohio at Chicago, entered railway service December 3, 1873, with the Chicago, Milwaukee & St. Paul, with which he was consecutively telegrapher, agent, train dispatcher and chief train dispatcher. In February, 1888, he became train dispatcher with the Minneapolis, St. Paul & Sault Ste Marie, later being made assistant superintendent and superintendent. In July, 1899, he became first identified with the Baltimore & Ohio as superintendent, afterward being advanced to general superintendent and assistant to the president.

He was made vice president October 31, 1915, and since April 10, 1912 has been president of the Baltimore & Ohio Chicago Terminal Railroad.

Archibald Fries, vice president in charge of traffic and commercial development of the Baltimore & Ohio, entered that service August 1, 1880, as entry clerk in the general freight offices at Cincinnati. On January 1, 1886, he was made chief rate clerk and was advanced to freight and claim clerk of the Continental Line, January 1, 1890. He was promoted to chief clerk in the general freight offices in Cincinnati, January 1, 1892, becoming general agent, October 15, 1898.

On the first of the following year Mr. Fries was made assistant general freight agent at Cincinnati where he remained until January 1, 1913, at which time he was transferred in the same capacity to Pittsburgh.

Three years later he was appointed freight traffic manager, and on July 1, 1918 became traffic manager of the Allegheny region under the Railroad Administration. January 1, 1920, he was appointed general traffic manager of the Baltimore & Ohio Lines, being promoted to vice-president in charge of traffic and commercial development March 1, 1920.

F. C. Batchelder, Vice President

More than a half century of continuous service is the record achieved on April 7, 1924, by C. W. Woolford, secretary of the Baltimore & Ohio. Thirty years of this time he has occupied that position.

Mr. Woolford has been with the Baltimore & Ohio under eight of its 14 presidents and as secretary under four of them, including President Daniel Willard. Since 1827, there have been only five secretaries of the Baltimore & Ohio, Mr. Woolford being the fifth.

Other officials of the Baltimore & Ohio have railroad careers that are longer, but there is none living whose continuous years of service with the parent organization—the Baltimore & Ohio—will surpass Mr. Woolford's. His railroad career is unique and it is safe to say that since the beginning of the Baltimore & Ohio no executive of that company with exception of Mr. Atkinson, secretary-treasurer from 1835 to 1869, held so important a corporate post as long as Mr. Woolford.

Archibald Fries, Vice President

When Mr. Woolford was only 14 he substituted a short while for a Baltimore & Ohio messenger boy. This was his first railroad experience. Evidently, the telegraph office made a strong appeal to his youthful imagination, for on the following seventh of April, 1874, Mr. Woolford started on his long climb, in the company's telegraph office, as messenger boy.

Being so close to telegraphy, he learned to master it, and his apprenticeship in the Morse code was as short as his term as messenger, for in 1876, when he was not quite seventeen years old, he was appointed telegraph operator at Bailey's, Baltimore.

Mr. Woolford's next position was as operator and bill clerk in the Baltimore & Ohio express office at Howard and Barre Streets. Here he won a reputation that stood him in good stead later.

In 1881 he was transferred to secretary to the assistant general passenger agent, where he remained eight years, being promoted in 1889 to ticket supply clerk. His next advancement came four years later, when he was made chief to the secretary of the company and in 1896, owing to the advanced age of former secretary Anderson, he was made acting secretary. On the first day of January, 1897, Mr. Woolford was appointed to his present position.

The only excuse for any job is the opportunity it offers to supply the needs of others.—Through The Meshes.

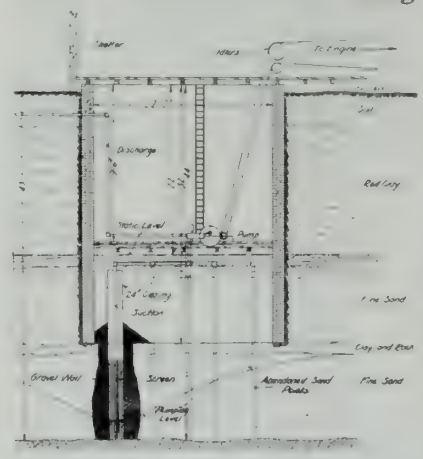
Increasing A Well's Volume

Keystone, Okla., 19 miles west of Tulsa, is an important watering station on the St. Louis-San Francisco Ry. Until recently every attempt to increase the water supply with the system used had failed.

The original equipment at this station consisted of a well 32 feet in depth, and 22 feet in diameter. The well was lined with a 13 inch brick wall. The well was excavated into a stratum of very fine sand 11 feet thick. At the bottom was found a two-foot stratum of clay which separated the upper sand stratum from another about 12 feet thick. In order to obtain water from this lower sand, five sand points were driven into it and each connected to the suction of the pump. The water was pumped from the lower stratum into the well which acted as a storage reservoir. The amount of water produced in this manner could supply only ten or twelve engines daily and this was far short of the amount needed.

Increased traffic on this division, due to the rapid development of the oil industry in the state made it necessary to develop a larger and more dependable water supply. So in March this year, a contract was let to install a gravel wall well in the lower stratum, and thus eliminate the use of sand points which were giving more and more trouble. It was decided to drill the new well inside and near the wall of the old one, close to the discharge pipe delivering water to the tank. A hole, large enough to accommodate a 42 inch diameter well casing, was sunk through the lower stratum. The casing was lowered into position and rested on blue shale, underlying the lower sand stratum. Into this casing was placed a five-foot section of 24 inch Layne shutter screen to which was riveted enough 24 inch well casing to reach the surface. Graded gravel was introduced into the annular space between the two casings. The 42 inch casing was raised seven feet, or two feet above the shutter screen, and the well agitated until all of the fine sand had been removed from around the gravel wall. This sand was sucked into the well and pumped out.

After the well had been thoroughly agitated and no more sand could be removed, more gravel was fed into the space between the two casings, thereby filling up the area from which the sand was removed. Then the 42 inch casing



was withdrawn from the well. With the well construction complete the sand points were disconnected from the suction of the pump and the suction was placed in the 24 inch screen. The gravel wall well, upon being tested, produced 150 G. P. M. or ten times the amount produced from the same stratum with sand points.

This new water supply could very easily take care of 30 engines a day, where the old system could handle only twelve. The gravel wall well was constructed by the Layne-Western Co., of Kansas City, an associate company of Layne & Bowler, Inc., Memphis, Tenn., under the direction of A. L. Fisher, division engineer of the St. Louis & San Francisco Ry.

What Fools There Be

It was a beautiful car. Guess they had just had it for a short time. The road was fine and they were "letting it out," racing alongside the train that bore us north. The driver waved his hand to us as he spurted ahead and then dropped back, speeding ahead again as we laughed at him. He was just showing us that he could beat us —even if we were traveling at around 60 miles an hour.

The engineer on our train blew the whistle, and the sound had barely died away when we saw the man in the car sink lower in his seat and "give it the gas." He disappeared from our view.

There was a little jar to the train, and soon we heard the grind of brakes. As we passed the crossing we saw clothing scattered along the way, and over against the fence was what looked like a woman lying face down.

Our train came to a halt. After a little while we went on again. In the baggage car on a stretcher was the driver of the car. A broken leg and several cuts were all he got out of it. His wife and two daughters would never go on a vacation again.

When he gets well, I wonder if he will ever attempt to beat a train to the crossing?—The Christian Home.

That there is nothing new under the sun is well exemplified by the quasi-motor-slang phrase: "Step on it!" It is asserted that this is a mere rehash of what young Raleigh said to Queen Elizabeth as he threw his cloak over the puddle.

Killed on His Last Run

Joseph Robe, veteran engineer of the Baltimore & Ohio was killed while making his last trip at the throttle when his locomotive and three cars of a Cincinnati-Pittsburgh passenger train were derailed near Cassell, O., a few days ago. He had expected to retire from the service at the end of the run. The locomotive and one of the cars rolled over a ten-foot bank. The fireman, T. A. Albun of Newark, O., was badly scalded and may die. No passengers were injured.

Robe was 63 years old.

Floodlights and Fences Stop Loss

Value in Safety Work

By C. L. Holland

RAILWAYS are spending fabulous sums of money promoting safety, and protecting their property in various ways. But accidents still occur—accidents for which they are liable in a number of cases; others for which they are not liable; but still they pay.

Thefts, damage to property and other depredations still occur. Some of these are not preventable, but many might have been avoided. The railroad police departments are functioning efficiently. Their members are performing their part in a splendid manner, but their numbers are limited, and the cost of increasing them is almost prohibitive in the majority of cases.

Two of the best bets the railroads are overlooking in increasing safety, reducing thefts, robberies, pilferages, and other losses of a like nature, is that of floodlighting their yards, and fencing their property with steel, burglar proof fence. Millions of dollars are invested in buildings, shops, tools, machinery, material, supplies and different kinds of expensive equipment. A large percentage of it is wholly, or partly unprotected over half, if not all of the time. In many places it is practically open to thieves, vagrants and trespassers.

It may, or may not be surprising to know that a big part of the general public looks upon railroad property as public property, and treats it accordingly. The average individual who would hesitate to invade private property thinks nothing of taking short cuts over railroad tracks; through railroad yards and grounds; through shops and engine houses, and treating these places as public thoroughfares. Children frequently use the yards as a playground; undesirables adopt railroad property as a hang out and loafing place. This practice sometimes results in serious, expensive, and altogether avoidable accidents. This means a tremendous financial loss to the railroads.

Proper fencing at strategic points affords a permanent and effective solution for a number of evils of this kind. A strong unclimbable fence stands constant guard day and night, in any and all kinds of weather, against thieves, trespassers and others. It is not on the pay roll, and requires little or no attention except an occasional inspection. It provides continuous protection for employer and employe. It prevents employes' leaving their place of duty at dangerous outlets, as well as dis-

couraging and preventing minor and major thefts of tools, material and supplies by the dishonest employe. Further, the advantage of having property properly fenced can not be estimated in times of strikes and other labor troubles.

About 100,000 persons are arrested every year charged with thefts from railroads. This number does not include those arrested for trespassing, such as train riding, loitering and loafing in railroad yards and on railroad property. Thefts for which they were arrested covered misappropriation of merchandise and other valuable lading from cars stored in yards awaiting movement; equipment from passenger coaches, sleeping and dining cars; materials of all kinds stored in yards, coal from coal chutes and bins; scrap and new metal, such as brass, lead, copper and babbitt from scrap piles.

Some thieves have gone so far as to jack up cars and remove brasses from the journal boxes. Others have removed brass ornaments, seat cushions and other fixtures from passenger coaches, silverware and foodstuffs from dining cars, bed linen and blankets from sleeping cars.

Not a few of these thefts were committed while railroad police officers were on duty in the near vicinity, but due to the absence of fences or lights, and the number of outlets, it was next to impossible for them to prevent these depredations.

A few months ago on one railroad, officers apprehended a thief who lived near railroad property. His premises were searched, and water coolers, coal scoops, wrenches, hammers, chisels and a score of other things were found. All of this stuff was the property of the railroad. His home was a veritable storehouse. He admitted having pilfered these things from the shops and yards.

The fencing of shops, freight and passenger terminals, warehouses, storehouses, engine houses, passenger and freight yards, station grounds, approaches to passenger stations, mean a cure for many of the evils enumerated. It unifies and improves the appearance of the grounds and surroundings; it makes them an easy controlled unit with smaller expenditures for policing and upkeep, as well as reducing the numbers of accidents and thefts. With the proper fence, the first cost usually is the last cost, as practically no expense is attached to the upkeep after the installation.

Well lighted railroad yards, buildings, and grounds not only will reduce thefts of various kinds, but will almost eliminate personal injuries sustained by the different classes of yard employes, it being reasonable to believe that floodlighting will have a strong tendency to remove the hazards responsible for them.

Freight claims due to rough handling of cars in yards containing merchandise and other valuable freight, will be considerably reduced. More cars can be handled in a well lighted yard in a given time at less cost per car. The cost of policing can be materially reduced and in many instances cut in half.

Floodlighting benefits all employes in yard service by changing a dark, or ill lighted yard into a safe and cheerful place in which to work. This means more efficient and better satisfied workers who will produce more and better results.

Many yards, large and small, are lighted in some way but not with floodlights. The average system of lighting produces glare and reflections which work a hardship on the employes instead of benefiting them. A yard properly floodlighted is free from glare, deceiving shadows, and misleading reflections, and the cost of current with floodlighting usually is lower than the old style methods of illumination.

Public Relations With Your Meals Now

Harking back to the days of Enoch Wood, of Burslem, England, one of the leading manufacturers of Staffordshire china 100 years ago, the Baltimore & Ohio is equipping its colonial dining cars with blue pictorial colonial china. The china is decorated with the most picturesque of the scenes along its route as well as the outstanding historical types of locomotives used on its rails in the last 100 years, as another commemoration of the Baltimore & Ohio centenary. The revival of this old-time idea fits in harmoniously with the appointments and construction of the colonial dining cars, each one of which carries out in detail the period it represents.

All of the various platters, plates and other dishes tell in pictures the romantic story of the Baltimore & Ohio. On the larger pieces, around the rims, are the "First Stone" of 1828, and the horse car on rails of 1829; the locomotives "Tom Thumb" of 1830, and the "Atlantic" of 1832; the "Winans' Camel" of 1851, and the "Mogul 600" of 1875, completing the circle of the plate or the oval of the platter with the big mountain type "Lord Baltimore" of 1925. In the center of the plates are engraved the "Thomas Viaduct" at Relay, Md., built in 1835; the "Carrollton Viaduct" of 1829, first and oldest stone arch railroad bridge in the world, Baltimore, still in use; the beautiful view of Harper's Ferry, W. Va., the "Cheat River Canyon," the "Potomac Valley," the "Narrows" near Cumberland, Md., and the scenic grandeur of Indian Creek, Pa.

The idea of thus commemorating certain events in the 100-year history of the Baltimore & Ohio was inspired by two souvenir china plates prepared by Enoch Wood to mark the establishment of the Baltimore & Ohio in 1827, one showing a locomotive of the Stephenson "Rocket" type, and the other an inclined plane, such as first used by the Baltimore & Ohio on its original line to Frederick.

Self-satisfaction often is fatal to success.

Among the Men and Women

The Ones Who Made the Show

THE biographical references at hand do not show that Edward Hungerford ever had any experience as an actor or showman, but the competent manner in which he planned, suggested, devised or executed the infinite details of the great task assigned him as director of the Baltimore & Ohio Centenary seem to justify a contrary belief. At some time in his interesting career he must have known the ecstasy of hearing what a fine actor he was and that he really ought to go on the road. No ordinary writing man could have handled the job as he did it. But of course Ed Hungerford is not ordinary in any sense. Anyone who reads the Saturday Evening Post—and who does not, please?—knows this man's whole life has been devoted to transportation. It has been his hobby for many years, a hobby that carried him far beyond the bounds of mere writing. Mr. Hungerford has long been a human Smithsonian Institution, what with historical records, models of this and that of great value and interest, a hobby certain to be very well worth while in the years to come.

Plans for the great exposition were forming several years ago when Hungerford began giving a part of his valuable time to planning it. For the last two years every hour has gone into this work, the results at Halethorpe proving him to be indeed the master showman referred to a moment ago. In conjunction with the engineering department he had much to do with designing and planning the buildings, and yet, throughout all the time, one seldom heard his name, a sure sign of genius. A very great assignment Mr. Hungerford had, and exceptionally well covered.

Edward Hungerford.

But, as in all such enterprises, there were other faithful, energetic workers, about 500 of them, employes of the Baltimore & Ohio, except for a very few outstanding specialists associated with the undertaking from the start because of their peculiarly valuable accomplishments in one field or another.

The entire cast of the pageant, including those charged with running and taking care of the engines, was made up of employes of the Baltimore & Ohio, with the exception of engineers and firemen sent by other railroads with their respective locomotives. Those having various roles in the pageant were taken from the general offices of the Baltimore & Ohio. Each character had to be measured for costumes and trained in various rehearsals for the big parade. The women's costumes, picturesque and colorful, were made under the direction of Helene Hedian by the Baltimore & Ohio employes who wore them.

The director of the pageant, to whom fell the huge task of superintending and directing all the work connected with the spectacle,

Those in Direct Charge of the Pageant. Mrs. Nathan Seated in the Center. Directly Behind Her, Standing, is Margaret Stevens, the Assistant Pageant Director. To the Left of Mrs. Nathan is Dr. Spaeth and Helen Hedian. To the Right is Charles Coburn and Olive Dennis.

was Mrs. Adele Gutman Nathan, well known in Little Theater circles of Baltimore, Washington and New York. She is the founder of the Vagabond Players of Baltimore, associate director of the Cellar Players of New York, and a contributor of articles to the Baltimore Post, New York Telegram, "Vogue," the Delineator, and the Atlantic Monthly.

Charles Coburn, well known actor, recited a scenario of the pageant, introducing the various episodes and periods as they appeared in the parade. The scenario, a narrative of the history of transportation written in blank verse, was the work of Margaret Talbott Stevens, associate editor of the Baltimore & Ohio Magazine. Mr. Coburn played the part of Old Bill in "The Better 'Ole" at Ford's Theatre in Baltimore in 1919. He and his wife have appeared in numerous dramas such as "The Yellow Jacket," "The Right Age to Marry," "So This Is London," and a repertory of 16 Shakespearian plays. In 1910 they took part in the historic Pageant of the Canterbury pilgrims at Gloucester, Mass., at which President Taft was present.

Arrangement of the various songs and musical scores in the pageant was handled by Dr. Sigmund Spaeth, who received his Ph. D. degree at Princeton University. Dr. Spaeth is a journalist and music composer. He has contributed to the New York Times, Evening Mail, Boston Transcript and various magazines. His musical compositions include: Jabberwocky, Madrigal of May, My Little Nest, Chansonette, Seven Ages of Yankee Doodle, and the Magic Flame. He is the author of "Milton's Knowledge of Music," "The Common Sense of Music," "Barber Shop Ballads," "Words and Music," "Read 'Em and Weep," and others. Dr. Spaeth has also had wide experience as song and recreational leader, conductor and musical lecturer.

Costume designing was in the hands of Joseph Mullins and Helene Hedian, head of the costume department of the Maryland Institute, Baltimore. Mr. Mullins is a graduate of the Parsons School of Costume Design in Paris and technical director for the Edwin Knopf Players at the Auditorium Theatre, Baltimore.

The pageant assistants were Edgar Bohlman, Robert Byrne, and Harry Winston. Baltimore & Ohio people connected with the pageant work were Olive Dennis, W. C. Baker, Paul Laustman, Harry R. Piet, Jr., and R. E. Powell and others who did heroic work even if not in the glare of the bright light of publicity. It's always this way.

The pet of the show, quite evidently, was Margaret Stevens. She seems to have done more, probably, than any one or a dozen regular employes, but if she did nothing more than write the Book of the Pageant, a "music story of inland transport in America; words by Margaret Stevens, with music arranged by Sigmund Spaeth," she would have been entitled, as she certainly is, to very high commendation.

And there was F. X. Milholland, assistant to the senior vice president—the "X" in his name means Cooperation — for goodness sake don't overlook Milholland. If it hadn't been for him and his inexhaustible patience and good humor, and his willingness to help out every worried newspaper and magazine man on the grounds there is no telling what might have happened. Mr. Milholland had charge of personnel, a mysterious word meaning he answered millions of questions, arranged for an untold number of photographs of everything except himself, saw to it that the press was well cared for, dug up data about everything imaginable except the cost of living, and made everyone feel that he and his assistants were there to help anyone who couldn't help himself. In all such great entertainments there is some such personage as Milholland to save lives and reason, but there are few so competent.

And the policemen! Every copper on the force was a wonder, uniforms immaculate, smiles and courtesy without end, railroad police who, thank the powers that be, didn't have to care a whoop about politics, never "bawled out" anyone, and had hundreds of reasons for doing it every hour of the day. One of these officers was especially noticeable. It was his duty—someone has to do the dirty work everywhere—to keep people from sitting on the fences. With the entire state of Maryland available for sitting purposes everyone seemed possessed by the overpowering desire to sit nowhere except on these

OFFICERS OF THE CENTENARY

Edward Hungerford, Centenary Director.
T. T. Maxey, Asst. to Centenary Director.

Adele Gutman Nathan, Pageant Director.
Margaret T. Stevens, Asst. Pageant Director.
Edgar Bohlmann, Pageant Assistant.
Robert Byrne, Pageant Assistant.
Dan Walker, Pageant Assistant.
Sigmund Spaeth, Musical Director.
E. Nelson Kratz, Conductor.
Charles Coburn, Announcer.
Joseph Mullen, Costumes.
Helen Hedian, Costumes.
Charles Chrisdie & Co., Costumes.
Harry Piet, Properties.
Messmore & Damon, Floats and Vehicles.
John A. Smith, Chief of Exhibits.
G. S. Robertson, Chief of Grand Stand.
E. V. Baugh, Chief of Cuisine.
Elsie Scott, Editor of Catalog.

General Committee on Arrangements for the Pageant

Daniel Willard, Jr., Chairman.
F. X. Milholland, Personnel.
Olive Dennis, Costumes.
T. C. Roberts, Properties.
R. M. Van Sant, Music.
E. M. Scheer, Transportation.
J. J. Nugent, Vehicles.

fences, and this chap had to prevent it. With a smile behind which there was no club but only good nature, he touched them on the arm or shoulder. It seemed to grieve him personally, but it was absolutely necessary to say that guests simply could not be permitted to sit on fences. For one thing these fences weren't very strong, he said, and he feared, indeed the whole Baltimore & Ohio feared they might break down and someone would be injured. It is more than likely this officer told this story a thousand times during the day, but always with a smile, and everyone moved politely.

A magazine editor was looking for a certain exhibit. One of the policemen was appealed to for information. He seemed positively distressed to discover that of all the things he did know about this wonderful fair here was one blank spot. For fifteen minutes he walked about seeking that exhibit, and then the search was abandoned, at least temporarily. Nearly an hour later this magazine man was astonished, in a great crowd, to be accosted by this same police officer, his face beaming with delight over the fact that he had found the missing exhibit.

They were an exceptionally fine force, these officers, especially patient and cheerful in answering the most amazingly foolish questions heard since the World's Columbian Exposition at Chicago which, for many years, is said to have held the record in the respect. Perhaps you remember the story of the thousands who asked repeatedly to be directed to the cage where the lagoon was confined, and displayed the most avid curiosity over the number of young a gondola had in a year? The same kind were at the Halethorpe exposition.

Two girls at least 16 or 17 years old, apparently as intelligent and normal as girls usually are at this interesting age, stood wonderingly before the exhibit of the Locomotive Stoker Co. What delighted them, they declared, were the "jumping peanuts" in the cage. Friends joined in their eagerness to watch the display, and all the while the odor of coffee was plainly evident. Finally, one of the girls, coming up for air, ventured the daring suggestion that the peanuts really were coffee beans, which chanced to be the truth, the company having taken that means of showing the operation of the stoker instead of using coal.

The Singing of the Baltimore & Ohio Glee Club Made Grave-Faced Executives Join in Joyfully, As Some Men Do At Rotary Club Luncheons.

Naturally, everyone noticed the drum major at the head of the centenary band. You just can't overlook a drum major. This one has an interesting history, too. F. E. Czarnowsky is his name. He is a retired drum major of the Fifth Regiment, Maryland National Guard, who couldn't resist the opportunity to take up again the old baton for a two-week period at the head of the 60-piece band which so delighted the visitors. Czarnowsky is 70 years old. For 31 years he headed the Fifth Regiment band. Don't get off wrong about his name. Czarnowsky was born in Baltimore.

And the Indians! They certainly did help to make this fair a huge success. The portrait of Chief Two Guns White Calf, the leader, is more familiar, possibly, to church and mission treasurers than to other persons being, as it is, on the reverse side of every Buffalo nickel of United States currency. The chief, accompanied by a score or more of the Blood and Piegan tribes from Glacier National Park through the courtesy of the Great Northern Ry., led his braves in the pageant with a display of the earliest forms of transportation known on the North American continent.

Some exceptionally fine work was done, too, by C. W. Egan, general claim agent of the Baltimore & Ohio. Among the many models of locomotives, railroad equipment and things pertaining to railroading was one of the Curtis Bay Coal Pier of the Baltimore & Ohio at Baltimore.

This carefully built miniature was made by Mr. Egan who spent 1260 hours on its construction. The model contains 18,694 separate pieces sweated together.

Mr. Egan's model is 12 feet long by 4 feet wide, the small reproduction of one of the fastest coal loading machines in the world, being 11 feet 4 inches in length by 22 inches wide, scaled three-sixteenths of an inch to the foot. It is built of phosphorous bronze, brass, copper and wood, and is run by electricity.

Many a man is wearing a medal because he didn't get scared till it was too late to run away.

It is easy to meet expenses now-a-days—you run into them every time you turn around.—Aetna Fire Messenger.

The New Step Closed.

A New Extension Step

The stools used for so many years by the Pullman Company and the railroads for loading and unloading passengers have been discontinued by the Southern Ohio Public Service Co. Instead, an extension step has been adopted as a part of the cars.

The step consists of a tread and toeboard mounted on strap iron hangers. These hangers extend upward at an angle to an operating shaft which is attached to the step skirting. The shaft is rotated by means of a handle installed alongside the permanent step construction. The step is lowered by raising this handle and when pulled down the step pulls into its running position.

Electric Giant for Great Northern

The largest motor generator type electric locomotive in the world, one of four being built by the General Electric Co. for the Great Northern Ry. for hauling passenger and freight trains through the new 7¾-mile tunnel piercing the Cascade Mountains, is being exhibited during October at cities along the Great Northern Ry. It is remaining at towns for a day at a time, and invitations have been sent out generally to railway engineers and executives to inspect the new power unit. Not only have these locomotives greater weight on driving wheels than any single cab units ever built, but they also are designed for higher operating speeds than is usual in freight service. They are, therefore, particularly adapted to handling the Oriental Limited and other passenger trains through the electric zone over the Cascades.

The locomotive has been so designed that speeds up to 50 miles an hour may be attained without interfering with good riding qualities. The locomotive utilizes the advantages of both alternating and direct current. Within its cab is a traveling substation, taking 11,000-volt alternating current from the overhead trolley wire and changing it to low voltage direct current for operating the driving motors.

In this locomotive the transforming equipment is completely automatic and can be started or stopped almost instantly by pressing a button in the engineer's compartment. Two of these locomotives, operating together as a single unit, will be used on heavy freight trains. This double unit will have a nominal rating of 5000 Kw. or 6600 horsepower. Because of the great flexibility and wide speed range of its regenerative electric braking, this type of electric unit is particularly suited to handling trains over heavy grades such as are encountered by the Great Northern in crossing the Cascade Range. The speed of the trains down the grade can be controlled with a minimum of switching and held at any desired rate, at the same time transforming the gravitational energy of the train into electric power and sending it back over the trolley wire for use at stations or by other trains.

Each of the new electric units contains a 2500-kilowatt synchronous motor generator set which supplies direct current power to the motors mounted on each of the six driving axles.

The Step Lowered at Station.

The Great Northern Ry. was the first transcontinental system to use electric locomotives, this pioneer equipment being first operated in 1909. At that time the electrically operated track through the Cascade tunnel was about four miles long. Four electric locomotives, weighing 115 tons each, were used for more than 17 years. Regenerative electric braking was used on these locomotives, this being the first commercial application of this feature in this country. The use of electric power in this tunnel successfully relieved smoke conditions and thus expedited the handling of both passenger and freight traffic.

A Handsome and Useful Catalog

One of the handsomest and most conveniently arranged catalogs received in a long while was received a few days ago from the Morton Mfg. Co. of Chicago. The manner in which the book is indexed is a delight and doubtless, a rather expensive one. No more comprehensive catalog of railway appliances and industrial steel products has come to this office. Typographically the book is about perfect, while the make-up and the arrangement of sections for the many applicances make it a pleasure to examine.

Studebaker Observation Parlor Coach. A Fine Example of Comforts Provided Nowadays for Passengers on Motor Bus Lines. Seats for 21 Passengers.

Keep the Motor Bus in Its Place

An Electric Railway Viewpoint

By B. W. Arnold

Chicago, North Shore & Milwaukee

THE motor coach has been developed and is a new and useful tool in the hands of skilled operators who have made transportation their life work. In the hands of inexperienced and irresponsible individuals it may easily become a disturbing and destructive factor in the industry, which in the long run can only be harmful to bus manufacturers.

There can no longer be doubt in the mind of anyone that the motor coach has a place, and an important one, in our scheme of transportation. We may disagree in details as to its proper place, but in the end I believe it will be found that the experienced electric railway operators are the men best fitted to put the motor bus in the place where it can be used to the greatest advantage in the service of the public.

The transportation field is a broad one. It embraces many problems, each of which may call for different treatment. The problems are so diversified that what is applicable in one situation may be utterly impracticable in another, although the two situations are seemingly alike. Transportation methods which are reasonably satisfactory, let us say in London, might not be workable in New York or in Chicago. The transportation problems of a nation are so vast and so complex that with all the available agents now at our command the public demand for transportation service never has been met fully in any country.

This public demand is growing year by year and will continue to grow indefinitely. As transportation companies engaged in serving the public, our business is to find ways of more nearly filling that demand, rather than to indulge in foolish controversies over substituting motor coaches for electric railways or motor trucks for freight cars running on rails, steam and electric.

The real problem confronting the transportation companies is one of adjustment, not of substitution. We can not at this time afford to discard any of the tools of our trade, but we can and should find the best and most economical use to which we can put them, always keeping in mind the trust imposed upon us of giving the public the service it requires.

I am a firm believer in the motor coach. Its flexibility gives it a decided advantage over the car operated on rails under certain conditions. The latest types of motor coaches have seating capacity almost equal to that of the cars used on surface, elevated and subway lines in our large cities. They are lighter than the smallest of our one-man cars of the Birney type. For certain classes of service they are better than the electric car.

Part of an address before the Motor Bus Division, American Automobile Assn., at Philadelphia.

Fully recognizing the many advantages of the motor coach, I am firmly convinced that it has its very definite limitations. It certainly can not now, and I doubt whether it ever can, take the place of the electric railway.

I am not sure that our experience with the motor coach as a substitute for the electric railway is extensive enough to be absolutely conclusive, in view of the constant changes being made in motor coach construction. The experience in Akron, Ohio; Des Moines, Iowa, and Bridgeport, Conn., where the motor bus had full opportunity to prove its ability to take the place of the trolley car, was anything but satisfactory to the public. Its failure in those medium sized cities, with the full support of the city administration in each instance and the sympathy of the people at first, does not inspire confidence in its performance in a great city where the rush hour problem is much more serious.

Careful studies and traffic checks made by competent engineers in a number of large cities during the hour of maximum travel place the capacity of rapid transit lines operating trains of cars over a single track at from 35,000 to 50,000 passengers an hour. The capacity of surface lines operating cars in single units is from 14,000 to 16,000 passengers an hour and of motor coaches of the double-deck type about 6,000 passengers.

The greatest need of the large city today is for rapid transit. As population grows and spreads farther out from congested areas, the need of rapid transit facilities increases. Few will contend that this need can be supplied by the motor coach operating on the surface and sharing the roadway with other forms of vehicular traffic.

A concrete illustration of the difference in speed made by an elevated rapid transit line and a motor coach is seen in Chicago, where the two forms of transportation parallel each other. From the city limits on the north to the Loop under the most favorable conditions the schedule of the rapid transit line is 30 minutes, while that of the motor coach is 68 minutes.

In Indiana experience showed that the motor coach cannot take the place of the interurban railroad for long haul traffic. It required considerable time, and cost the electric railroads and the motor coach companies a lot of money to find it out. The result of the experiment was a receivership for the motor coach company. In a public statement issued at the time by the receiver for the motor coach company he said: "It is becoming apparent that the operation of motor buses should be coordinated with existent steam and electric forms of transportation. The buses find it impossible to stand alone, but are logically indispensable in rounding out a complete, unified transportation system."

From my experience in the operation of electric railways and of motor coaches I have reached certain conclusions which may be summarized as follows:

In mass transportation the motor coach is not a substitute for the electric railway.

It is not adapted to rapid transit service, which is the greatest need of the hour in all our large cities.

In interurban service the motor bus is less efficient than the electric railroad in long distance travel. Its operation in competition with an electric railway capable of adequately supplying the needs of a territory is economically unsound and not in the interest of the public.

Operated in conjunction with the electric railway the motor coach is not only useful but indispensable as a part of any properly coordinated transportation system.

In many classes of transportation service the motor coach is better adapted to meet the public requirements than is the electric railway.

Electric railway managers, experienced in the business of transportation, are the men best qualified to find the proper place for the motor coach and utilize it to the best advantage. Instead of assuming an indifferent if not hostile attitude toward the motor coach, the electric railway companies should welcome it as a valuable aid in helping to solve many of the problems confronting them. Its usefulness has been fully demonstrated, and if its proper place in our scheme of transportation has not been found the

Fageol Truck and Reliance Trailer Operated by the Golden Gate Motor Transport Co., for Perishable Freight on the Pacific Coast.

Primitive Methods of Transportation in Motorless Countries. A Native Cart in Baroda, India.

fault lies largely with the electric companies that have failed to appreciate the value of this new tool of their trade.

The Sedative Sermon

A churchgoer at Madill, Okla., drew his car up to the church window on Sunday morning, and settled comfortably in the cushions to listen to the preaching.

The sermon closed and the pastor began to pray, when a long insistent blare of an automobile horn cut him short. A deacon, dispatched to end the din, found his brother member asleep across the steering wheel, his head resting on the horn button.

Orders To Cars By Radio

Wireless-equipped automobiles, more than 100 of them, have staged the first automobile radio rally near Paris.

The cars received their orders by radio and were sent 150 miles over bad roads in various directions. All arrived finally in the late afternoon at the Montlhery speedway south of Paris.

The contest, encouraged by the government, was intended to develop ideas for rugged portable equipment that could stand hard usage and rough riding.

Every hour additional road directions were sent out on a 322-meter wave. Each contestant had to prove by a textual report that he had received the orders and had not simply followed other cars.

The car with the antennae in the top caught the wireless while traveling 30 miles an hour. Most of the instruments were built by amateurs.

The Grade Grossing Toll

There were 297 persons killed and 1054 injured in 2233 grade-grossing accidents in California from January 1, 1925, to May 10, 1927, state railroad commission statistics disclose. Property damage occurred in 1360 crashes.

Analyzing the accidents, the commission finds that crossing bells are proving an important factor in eliminating accidents, only 34 accidents having taken place where grade-grossing warning bells are installed. Other accidents occurred as follows:

Crossings protected by signs, 946; wigwag signals, 654; flagmen, 290; overhead crossing signs, 293; gates, 34.

How Did Dalrymple Do It?

It isn't easy to describe something which, despite the photographs, you are informed officially, has no existence. For instance, this four-wheel drive truck used by a Los Angeles company. This unusual vehicle is assembled on an International motor truck chassis,

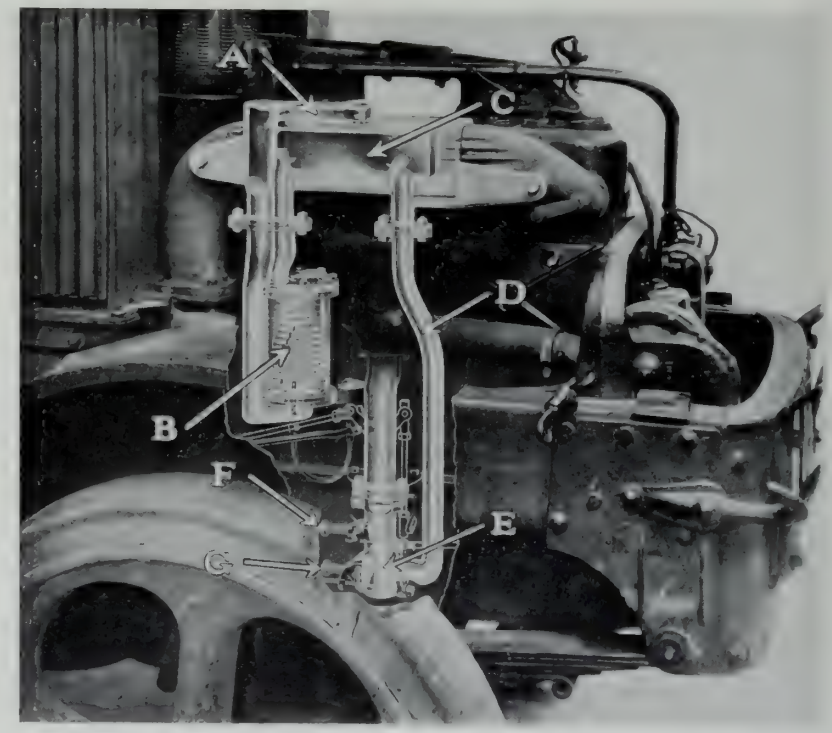
Revolutions Have Not Come Fast Enough in Guatemala to Catch Up With Modern Transportation. A Cart on a City Street.

and is built of International motor truck parts exclusively; but the International Harvester Co. does not make a four-wheel drive model, nor does it manufacture parts for such an assembly. What to do?

It's a long story the way the publicity man turned it out but these are the facts: The trucking company needed a truck for certain extremely difficult work through regions where roads are almost unknown. The vehicle must be able to climb bumps and ruts, hogbacks, mountains and valleys. Nothing seemed quite up to requirements. The company's engineer turned the trick—his name is Earl Dalrymple. The four wheel drive machine he made, shown in the pictures, was worked out by Dalrymple from standard International two-wheel drive models, and the result has been astonishing. "It is pretty good proof of what a four-wheel drive truck can do under a variety of road conditions," said Louis C. Lieber, manager of the International sales force, after describing an extremely severe test. "The flexibility of this four wheel drive and its even tenor of operation over every kind of road, seems to point to a type of motor truck assembly that will be a popular factor in the progress of transportation."

Improved Carburetion Assured

Existing systems of carburetion, which deliver "wet" gas to automobile cylinders, are conceded to be one of the greatest evils in automotive operation today. With "wet" gas, large quantities of gasoline are wasted, combustion is incomplete; carbon is formed; spark plugs are fouled; crankcase oil is diluted; engines knock and wear faster; efficiency is materially lowered. Joseph J. Sullivan, a man of long experience in automotive engineering, has developed an improved method of delivering the fuel charge of gasoline to the cylinders, in the form of a "dry" vaporized gas.



A—Air Heating Chamber. B—Vaporizer. C—Vapor Superheating Chamber. D—Vapor Passage. E—Control. F—Low Speed Cold Air Valve. G—High Speed Cold Air Valve.

The Sullivan vaporizer feeds a "dry" vaporized gas to the cylinders of the engine. Since the "dry" gas explodes thoroughly and quickly, combustion is more complete. Engines are instantly responsive. Greater, more uniform power is provided. Bucking and sputtering in starting are eliminated. The engine operates efficiently through all temperatures. The motor does not knock. Crankcase dilution is minimized, carbon and fouled spark plugs are eliminated, because their cause—"wet," unburned gasoline—is not present in the cylinders. Tremendous savings in gasoline are effected.

Air enters the air heating chamber indicated as "A" in the illustration, where it is heated and drawn downward, entering the vaporizer proper (B). The velocity of the air passing the jet draws the gasoline upward from the jet, spraying it through a series of 11 perforated baffle plates.

These baffle plates, scientifically arranged and staggered, break up the gasoline and air in its passage, and permit only a fine vaporized gas to pass upward into the vapor superheating chamber (C).

The heavy ends or drops of the gasoline, being unable to pass the baffle plates in the vaporizer (B) are dropped into a trap at the base of the vaporizer (B), from which their only escape is by vaporization up through the baffle plates.

After the vaporized gas leaves the vaporizer proper and enters the vapor superheating chamber (C), it is drawn downward through the vapor passage (D) into the control (E) which is equipped with a low speed cold air valve (F) and a high speed cold air valve (G). In this control, the air to fuel ratio is obtained, which is materially greater in air ratio than it is possible to use with any other existing method of carburetion.

At low engine speeds, the low speed cold air valve admits the required volume of cold air, while at a predetermined increase in engine speed, the high speed cold air valve functions to admit the required greater volume of cold air.

These valves are adjusted at the time of installation, and sealed in position.

Passage of the vaporized gas through the control is regulated by a butterfly operated by the accelerator. Vaporized gas passes the butterfly into the manifold and thence to the cylinders, furnishing an absolutely "dry" vapor of gas to the combustion chamber.

This View Shows the Flexibility of the Truck the Dalrymple Person Assembled From Various Sources.

Bookkeeping for a Truck System

By M. Zass
Milwaukee Elec. Ry. & Light Co.

Motor truck and automobile accounting system must necessarily accomplish two things: first, it must provide for the accurate and simple accumulation of all costs of operation; second, it must provide a means of properly distributing such costs over the various accounts which have received the benefit of the operation of the various pieces of equipment.

In order that costs can readily be accumulated we should have a special account into which is charged all costs of operation and maintenance of automobile equipment. So that we may know at the end of the month, in general, what expenditures have been for, and thus gain better control of the account, as well as aid in the management of the maintenance and operation of the fleet, the costs should be classified into several components of similar nature. For ordinary operating conditions the following division ought to be sufficient:

- Superintendence.
- Maintenance and repair of equipment.
- Gasoline and oil.
- Tires and tubes (replacements and repairs).
- Cleaning and washing.
- Tools and miscellaneous expense.
- Power, light, heat, water, etc.
- Maintenance of buildings, fixtures and grounds.
- Fixed charges.

These divisions of the automobile special account are merely arbitrary and can be added to or combined as local conditions and the size of the fleet may require. For each of the divisions which we find necessary and expedient to make, we should, of course, carry a sub-account, so that charges for labor and materials can be properly classified and allocated.

Sub-account No. 1, superintendence, is rather self-explanatory. To this sub-account should be charged all supervisory labor, such as garage foreman's salary, assistant foremen, clerks, stenographers, timekeepers, etc., and office expenses. Where the fleet is small, naturally the supervisory force is likewise small, and in some cases, perhaps only a portion of one man's time would be properly chargeable.

Into sub-account No. 2, maintenance and repair of equipment, should be charged all labor and material expended in the inspection, repairing and overhauling of equipment. This sub-account will undoubtedly show the bulk of the total cost in the account, and if further refinements are desired it may be split up to show, for instance, cost of engine and chassis

Part of a paper read to the accounting section, Wisconsin Utilities Assn., at Green Bay. The second part will appear in an early issue.

Another View of the International Assembled Truck Described in the Text.

repairs, body repairs, painting, etc. This is entirely optional and local conditions and size of fleet again govern.

The purpose of the next five classifications, namely, No. 3, gasoline and oil; No. 4, tires and tubes; No. 5, cleaning and washing; No. 6, tools and miscellaneous expenses, and No. 7, power, light, heat, water, etc., are so self-evident that they perhaps do not require any further detailed explanation.

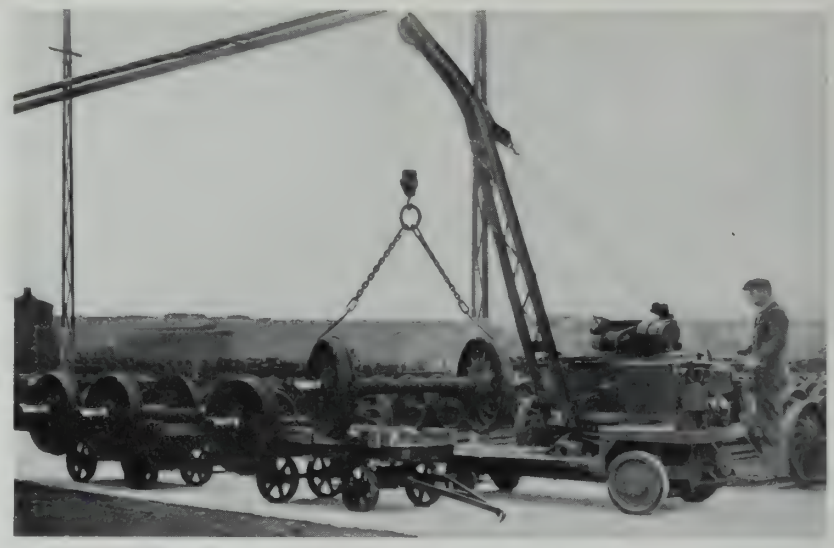
Sub-account No. 8, maintenance of buildings, fixtures and grounds, should be charged with the maintenance of garage buildings and equipment usually considered a part of the building, such as the heating plant, steam, water and air piping, plumbing, etc.

If the building is owned, a rental charge should be set up, and if the building is a rented one, then, of course, the rental cost should be charged into this account. If the building is owned, the rental charge set up should be adequate to cover interest, depreciation, taxes and insurance on the building. If it is a rented building, then the rent paid, naturally, covers such fixed charges.

Sub-account No. 9 covers fixed charges. This has reference to fixed charges on the automobile equipment only, and not on buildings, fixtures and grounds, as covered in the previous sub-account. Under this title of "Fixed Charges" are included:

(a) Interest on the investment.
(b) Depreciation.
(c) Taxes.
(d) Insurance.
(e) Injuries and damages.

Thus far we have an outline of an automobile special account that would give us a cost of a fleet of automobiles and trucks divided into nine general subdivisions or classifications indicating the nature of the expenditures made. With the operation of but a fleet of cars all of the same make and capacity it would be a relatively simple matter to determine the average cost of operation and maintenance per car, either on the basis of cost per mile, hour or day. But where we have more than just a few pieces of equipment, we will usually find a number of different kinds and capacities of automobiles and trucks, each best suited for the particular kind of work for which it is especially required. This, then, makes our accounting problem more complex, and especially so where there is a large number of different kinds of equipment.



Auto Crane Used in Moving Heavy Objects and Supplies In Illinois Central Stores Yards, Chicago.

Why Engineers Are Gray

"Not long ago, I crossed Nevada in the cab of a locomotive," said a railway official, as reported in The Kodak Magazine.

"At one point the highway was parallel to the railroad for quite a distance, then it crossed the track and continued beside it. The ground was level, the highway and the railroad were straight; there was not so much as a clump of sage brush to obstruct the view, and a passenger train in open, level country on a bright summer day is a conspicuous object.

"Along came an auto, and when the driver saw the train he stepped on the gas and endeavored to beat it to the crossing. He miscalculated, and did not quite make it. Instead, he ran into the side of the third car from the engine. Fortunately he was not killed.

"Later, I rode in the cab of a locomotive which was pulling a train between Youngstown and Cleveland, O. Approaching the crossing, I saw the driver of a flivver making desperate efforts to reach the crossing ahead of the train. He got across ahead of the pilot by five-eighths of an inch, so far as I could judge—or let's say three-quarters of an inch. When he was across the track, he slowed down to watch the train go by."

If we were asked to name the greatest dividend producer year in, year out, we would unhesitatingly place good nature at the head of the list. Good natured people get things done, and it is only deeds accomplished that ever pay. Even though we must never forget that the foundation laid by intelligent thought gets the machinery going, it is good nature that keeps it oiled. —The Ruler.

A man is as young as he feels —but not always quite so important.

Next to being capable of leading, the best thing is to be capable of being led.

Queer Happenings in September

THE queerest happenings in September were in the automobile world—two accidents such as never were recorded since motor cars came into use.

In the second week of the month the dancer, Isadora Duncan, was killed in France when her scarf got tangled in the front wheel of the automobile in which she was riding throwing her to the ground and breaking her neck.

A singular parallel occurred September 17, in Germany, while Burgomaster Ellendt of Ratibor was motoring home from a political meeting at Neustadt. A small fly got into the chauffeur's eye and caused him to lose control of the car. Burgomaster Ellendt was thrown out and in some manner his long gold chain became tightly twisted around his neck and choked him to death. The chauffeur was only slightly hurt.

These Corporations

Before the Argonaut had come to a full stop at Tucson, Chief Clerk Dick Smith met Dining Car Steward A. J. Cohen hurrying along the platform.

"There's a sick baby aboard," said Cohen, "and I've simply got to have some goat's milk. The mother is just about frantic."

Smith rushed to a telephone and called all the restaurants and markets in the city, but there was no goat's milk to be had. Then he remembered that General Foreman Phillip T. Garigan had some goats.

"Sure, I can fix you up," Garigan replied over the phone. "I'll send word to my wife and she'll be down to the station right away."

Arrangements were made to hold the limited train, but through some misunderstanding it left before Mrs. Garigan arrived with the milk.

But Smith was not to let that stop him from getting the milk to the baby. He telephoned the dispatcher at El Paso. The Argonaut was ordered held at Mescal. In the meantime the Golden State Limited pulled into Tucson following a few minutes behind the Argonaut. The bottle of goat's milk was given to some one on No. 4 and as the limited met the Argonaut waiting on the siding at Mescal, the milk was passed over to Steward Cohen.

The Argonaut arrived at Benson on time. The baby's cry was hushed, the mother was happy.

So Now He's Happy

Hugo Rich, veteran engineer, 43 years on the Missouri Pacific Railway, has his own private whistle back again. In 1922 the president of the Lackawanna Railroad gave him a whistle for his locomotive. Recently Rich was transferred to one of the newest of the Missouri Pacific's locomotives. He was proud of his new engine but missed his old whistle. Vice President Safford heard of the case and had the whistle transferred to Rich's new engine. And now Rich is happy.

The William Crooks Revived

An old brass trimmed wood burning locomotive, whose first run into St. Paul 76 years ago wrote a new chapter in the history of the Northwest, is wheezing along toward Baltimore, under its own power. Patriarch of railroad locomotives, the diminutive teapot, "William Crooks," has come out of long retirement to draw two tiny passenger cars to the Maryland city. There they will be exhibited with other railway equipment that made railroad history.

The William Crooks was retired in 1908, after 50 years service. It was the first locomotive in the Northwest service on the ten-mile line of the St. Paul & Pacific, frightening the Indians and racing deer.

Keeping It in the Family

When word was sent to French government railroad officials, one day last month, that according to the records one of the company's pensioners would celebrate his hundreth birthday anniversary preparations were ordered immediately for a public ceremony in the man's honor. Then it was discovered that Jean Baptiste Tourenne, 60 years old, a son, had been drawing his dead father's pension for 20 years, so long indeed, that a new generation of cashiers took it for granted the man they paid was the pensioner himself. Tourenne, therefore, kept on getting paid and lived without working. A judge sentenced him to a year in jail.

No One Killed, However

A telegram from Circle, Alaska, September 16, said that town, not far from the Arctic circle, had just seen its first automobile. The car, carrying officials of the Alaska road commission, arrived there from Fairbanks over a road just completed by the federal government. When completed this fall, the road will run from Valdez on the coast to Circle, nearly 400 miles in the interior.

A Real Fly Cop

S. E. Richter, Austin aviator, is facing charges of flying an airplane with false numbers.

The arrest was made by Parker Kramer, air inspector for the de-

partment of commerce. While flying above Nacogdoches, Texas, a few days ago, Kramer spotted the false numbers on Richter's plane and forced him to land. Richter's plane was seized.

Just Like A Motorist

The family of Engineer Yates on the Seaboard Air Line had a turkey dinner quite unexpectedly one day not long ago. While Yates's train was running along through the Ocmulgee River swamp between Americus and Savannah, Ga., two large wild turkeys, confused by the noise, presumably, flew against the train. One, the gobbler, was so severely injured that the engineer stopped his train picked it up and took it home to the family. The other bird escaped.

Private Plane for Ranch

Arthur H. Kudner, owner of the O-Bar-O Ranch in Lincoln county, New Mexico has arranged for private airplane service between Chicago and Carrizozo, N. M. The schedule calls for week end flights to enable Mr. Kudner and his friends to take full advantage of the hunting season in the Southwest without interruption to business.

The Sun Blamed for Wreck

A "sun kink" in the rails, caused by excessive heat, was blamed for the wreck, September 12, of a Rock Island passenger train near Centaur, Mo. Twenty-four persons were injured.

Airplane Flies Without Pilot

Capt. Richard H. Depew Jr., Fairchild Company pilot, has demonstrated at Curtiss Field, L. I., that an airplane can fly without a pilot at the controls.

Depew, with Mrs. L. S. Benedict of Johnson City, N. Y., and Ernest Robinson of the Fairchild Company as passengers, took a monoplane to an altitude of 3000 feet over the field, set the throttle and the stabilizer and walked to the back of the cabin.

For twenty minutes the plane held its course, heading out over Long Island Sound. Another plane, riding alongside, had as a passenger a photographer who took snapshots.

'Way Down Upon the Suwanee River

After lying at the bottom of the Suwanee River for nearly 40 years an old flat car of the Georgia Southern & Florida Railroad is now bleaching its "bones" on the banks of the river at White Springs.

It was taken from its place at the bottom of the river September 10 by the crew of the wreck train.

It was found that this car went into the river in 1889 when a working train was wrecked, and going beneath the waters it was left there and no effort made to bring it up until it was caught by the crane a few days ago.

The old car is now a curiosity to many of the men employed on the Georgia Southern & Florida division of the Southern Railway System. It is the old link and pin coupling type, in use during that period, and many railroad men never have seen one of those old cars.

These High Pressure Days

Breakfast was served to ten passengers, and a newspaper was published 7000 feet in the air above Los Angeles one day in September.

The unusual feats were held in one of the Maddux Air Lines' big Ford tri-motored planes of the type to be used by the company in transporting passengers between Los Angeles and mid-western points.

"The Maddux Air Lines News," a mimeographed "one-sheet" was prepared, stenciled and published after the plane hopped off. After the breakfast had been served and the "newspaper" published, dancing was enjoyed. A portable phonograph provided the music.

A wealthy westerner wishes to embark on some business venture that will be "exciting," and wants suggestions. A drive-it-yourself airplane company might offer interesting possibilities.

North Holland has new electric street cars with a transmission system similar to those of automobiles.

Railway rates in 1921 were at their post-war peak and the average revenue per ton mile was then about 77 per cent higher than during the period before the war (1911 to 1917). Since 1921 railway rates have declined, and the reductions in the average revenue per ton mile since 1921 have saved the customers of the railways nearly three billion 200 million dollars, or an average saving of more than 600 million dollars a year.

New Bulletins

Bulletin 94, issued by the Roberts & Schaefer Co., Chicago, describes newly developed spiral lowering chutes to minimize breakage and segregation of lump coal in locomotive coaling plants. Bulletin 96 illustrates the new "N and W" type engine coaler and cinder plant, said to be a money saver for railroads, and Bulletin 97 tells interesting things about the Beamer patent steam sand dryer now used by 45 railroads. Any of these bulletins may be obtained from the company upon request.

One of the smallest engines ever built, being the size of the palm of the hand of the builder and having a tender an inch and a half long, recently pulled a train of cars weighing two pounds, in an exhibition in England.

How the Santa Fe Makes Mechanics

National Plan Proposed

By F. W. Thomas

THE old scheme of binding out a boy to a master has gone, and no one now would revive it; education is too general, too selective, for such a method. Keep and board are not the right kind of remuneration, and one's ideas of freedom and liberty revolt at this method.

The second stage of indenturing a boy to learn a trade with pay and placing him in your shop to "root, hog, or die" under the prevailing demands for output, without any one to guide or direct his young hands, results too often in not the survival of the fittest but of the toughest, and, very few American boys will stand such rigorous treatment. So if we are to have an apprentice scheme fitted to our needs, it must also be fitted to the times and to the boy of the day. We must teach him his trade with modern methods surrounded by modern equipment. In the commercial or manufacturing field there is not such a demand or requirement for the so called all around, skilled mechanic as with the railroads. A worker in a large manufacturing shop will perform one job hour after hour, day after day, year after year, and become an automaton or a machine. He can be taught to do that job in a few hours, improving with practice and time, but he is good for only that one job or operation, while with the railroads he may be called upon to operate the simplest sort of lathe in the morning and the most intricate universal miller in the afternoon. He may be assigned to the erecting floor the next morning and to the enginehouse for running repair work a few hours later. The requirements of a railroad mechanic are greater today than ever before, and the introduction of new complicated machines, some automatic and semi-automatic, has not lessened the skilfulness of the operator, certainly not in our railroad shops.

Instructing Boiler Maker Apprentice in Laying Out Work in the Santa Fe Shops at Topeka.

The intervention of federal and state governments in the operation of the railroads has so flanked them with rules and laws as to the repairs and maintenance of equipment that the present-day railroad mechanic must be a mechanical lawyer as well as an artisan. There are over 50 laws or rules governing the maintenance of locomotive boilers. There are over 50 laws or rules governing the maintenance of the machinery for locomotives. There are several hundred rules governing the maintenance of freight cars. When and where must he learn all these rules and laws? He can't wait until his road is haled before a court for some act of omission on his part, nor can he afford to have his road's equipment tied up with a yellow flag by a federal inspector. He hasn't the time to stop work and look up the law or rulings on height of a car coupler or the crosshead lateral allowable by the inspectors. He must have these on his tongue's end, ready to answer and apply.

How are we to get such men, such artisans, such mechanical artists? I am speaking only for the road with which I am connected and which I serve. We have now and have had for 20 years a real apprentice system of training and educating mechanics for our shops, enginehouses, and car yards. It starts with the selection of promising boys, and through a well defined scheme of shop and schoolroom instruction fits them for any class of work of their chos-

Part of a paper delivered at the Kansas City meeting of the American Society of Mechanical Engineers. Mr. Thomas is supervisor of apprentices for the A T & S F Ry., at Topeka.

en trade. The educational requirements of applicants are not exacting, in fact, very reasonable; any eighth grade boy should meet it. A little practical psychology in examining the applicant generally will forecast his future. We care nothing about character letters; do not ask for them, and often fail to use them if offered or received. We do care for the boy himself, his mental activity, his industry, his interest manifested in the trade he wishes to learn. His indenture requires him to learn, and obligates the company to endeavor to teach him the trade. To carry out this obligation we do give him an opportunity, the best we can provide, and it may be said that the Santa Fe is very resourceful. All the brains, the talent, the experience, the machinery, and devices of that great railroad are back of that obligation, and the management will accept no excuse, no explanation for the failure of the party responsible to give that green boy a full, complete opportunity. To carry out this obligation we have organized and developed the necessary machinery. The boy, after indenturing himself, with the approval of his parents, is placed in the shops where he starts out on the four year course. We have provided shop instructors, the best men of the line, to take him in hand and teach him every branch of his trade, the operation of the various machines, the performance of the various vise and bench jobs, the various jobs on the erecting floor. He is taught the best possible way of performing each job; to take care of his person; to avoid injury to himself or to his fellow workmen; to preserve and save company property and material. He is taught promptness and regularity in his work and obedience to authorities. He is shown and taught the correct interpretation of the various federal, state, or company rules respecting the work in hand through practical contact with the object. A set schedule is prepared for each shop, and all have equal opportunity.

Models Used in Teaching Mechanical Drawing in Apprentice Schools of the Santa Fe System at Topeka.

Supplementing the practical shop instruction, apprentice schools are maintained on shop premises where the apprentice is required to attend two sessions a week of two hours each. He is taught mechanical drawing. One of the best training subjects for a mechanic, as it teaches him to be exact—I have no faith in these so-called "blueprint reading" schemes. He is taught free hand drawing or sketching to enable him to illustrate his object; some shop mathematics, arithmetic, algebra, and geometry, all grouped together and called "problems;" a treatise on his trade; the company book of standard practices, the theory of special subjects or elements, air brakes, superheaters, boosters, valve setting, company, federal or state rules, and laws relating to work in his department; and finally given an examination on the subjects we have been teaching him all these four years as a test of his memory, industry, and application. A schedule time is set for each drawing, each problem, and each supplementary subject; for example, we allow him 3.2 hours for making Drawing 47, 40 minutes for working a block of five problems, and so on through all the subjects. This gives us a good idea of his industry, aptitude, and application.

The schedule is made to fit the average boy and must be complied with if the apprentice is to be graduated. Many forge ahead of the schedule and are given supplementary work which increases their general knowledge and places them on the honor roll of "possibilities for promotion." We have established one thing in handling apprentices which has proved most valuable in ascertaining the fitness of the apprentice to continue his apprenticeship: a probationary period, the first six months. During that period he must show unmistakable evidence of talent. Second, we created a reviewing body known as the apprentice board, composed of the master

mechanic, general foreman, department foreman, and shop and school instructors. This board meets once a month and discusses all apprentices in the probationary period and all others once every six months, or oftener when their names are brought before it. It endeavors to find out everything pertaining to the individual apprentice; encourages, corrects, disciplines, or dismisses as occasion demands; devises means for bringing out the timid or backward boy; endeavors to strengthen the weak though willing boy; encourages the strong, the active, and the promising. The members of the board are inquisitive, fair, and impartial. They know the boy as a man will soon be working for them, and all foremen are anxious to have good men. We encourage and aid these young employes not only in developing into good mechanics, but in becoming loyal employes, good citizens of the community.

At all mechanical points the apprentices are organized into clubs which handle all their outside activities. These clubs offer opportunities for athletics in season, social diversion, and education and cultural diversion. They have glee clubs, bands, orchestras, baseball, football, basketball teams, often tournaments bringing teams 1000 miles for the contests. These apprentice clubs have an annual conference limited to four delegates from each club, but in addition each club may send a basketball team. These conferences are gala events, much sought by cities along the line from Illinois to California, and much prized by delegates. To be eligible for club membership or as a member of an athletic team, each must be up in his scheduled apprentice work and enjoy the endorsement of his apprentice board. Cups, trophies, and prizes other than money are offered. One formal party or dance is given by each club yearly, with informal parties or picnics more frequently in season. The whole scheme is

Blacksmith Apprentice in the Shops of the Santa Fe System at Topeka.

to make first class mechanics, superior to any in the world; intelligent and valuable citizens for the community; contented, happy, and loyal employes for the road.

Painter Apprentice in the Stock Room.

You may say this costs money. All good things cost money, but one railroad has found that it is a paying investment. There is no road in the country that has mechanics superior to those on the Santa Fe; there is no road that has a smaller labor turnover. We have shops on our line which have not employed one mechanic from the outside for 18 months. Very probably none will be employed during this entire year.

While our chief purpose is to provide first class skilled mechanics to man our shops, we enjoy other blessings from our apprenticeship system. It supplies ample material for all our shop foremen, draftsmen, for our designing or drawing rooms, assistants for the test department, staff officers, inspectors. Is it not worth something to the foreman, to the master mechanic, to the management to know they have men in the ranks, trained and drilled for any emergency—for any vacancy—for any position? The apprentice system during the last 15 years has supplied the Santa Fe from its graduates: 7 master mechanics, 23 general foremen, 16 enginehouse foremen, 63 assistant enginehouse foremen, 39 machine and erecting foremen, 18 boiler foremen, 47 apprentice instructors, and 29 other positions above the ranks or a total of 242 in official or staff positions. These are young men with long years of usefulness ahead of them, years to serve the road which has trained them. The human element has been greatly neglected by many of you. It has been, is now, and al-

In the Santa Fe's Apprentice School at Topeka.

ways will be your greatest problem.

In the subsequent discussion, John H. Linn, from the Santa Fe's apprentice instruction force at Topeka, said that the age limit for regular apprentices was 18 to 22 and in the car department 18 to 26. The regular apprentices were paid at the rate of 33 cents an hour at the start, with an increase of two and a half cents an hour every six months for the first three years, and slightly larger increases for the fourth year, the rate for the eight six-month period being 58 cents an hour. The rate for the freight carman apprentices was somewhat higher, namely 48 cents for the first period and 63 cents for the sixth period.

One Hour of Railroading

An hour is a relatively short time, yet within that brief period the railways of the country perform a service for the public, on the average, of amazing volume. Some of the work done in an hour by Class I lines is shown here based on the figures of operations in 1926. It should be realized, of course, that these figures are averages.

In an hour, the railways receive gross revenues amounting to $728,251 from their transportation operations.

In an hour, the railways pay $336,632 in wages. Much of this total is included in operating expenses.

In an hour, the railways spend $196,046 in other operating expenses.

In an hour, the railways pay $44,370 in taxes to national, state and local governments.

In an hour, 6,086 cars are loaded with revenue freight on the railways' lines.

In an hour, 152,572 tons of revenue freight are loaded into freight cars.

In an hour, 98,213 passengers board the railways' trains.

In an hour, the freight service performed by the railways is equal to hauling 50,689,328 tons of freight for one mile.

In an hour, the passenger service performed by the railways is equal to hauling 4,051,019 passengers for one mile.

Why Taxes Are High

The state of New York owns and operates the Erie Canal, representing a capital investment of 170 million dollars. The annual fixed charges for carrying this investment—interest charge at an estimated rate of 5 per cent—is $8,500,000.

Between 1919 and 1925, 12 million tons of cargo have been freighted on the canal at an operating loss of 84 million dollars—nearly seven dollars a ton—a deficit the New York taxpayer has been called upon to meet.

During this same period, railroads operating in New York state have paid 141 million dollars in taxes.

It amounts to this: Privately owned railroads have been called upon to pay the state for the losses sustained by the state in maintaining a transportation system in competition with the railroads. A snug arrangement.

In his report to the governor of New York, the superintendent of public works says:

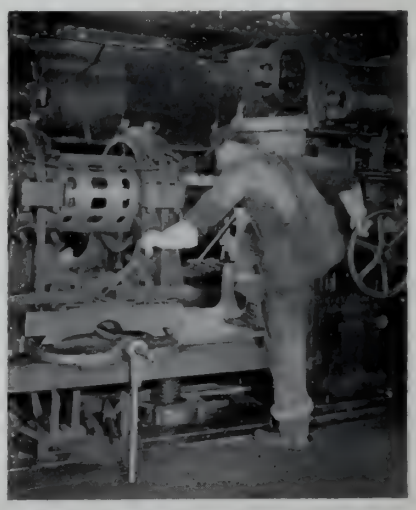
In 1925 it cost the state $4.51 a ton for all freight floated on the canal, regardless of the length of the haul. From these figures it is evident that it would have been cheaper for the state if all the freight carried on the canal had been put on railroad cars and the state paid all the freight bills.—Nation's Business.

The Busy Reefers

More than 86,000 refrigerator cars are busy night and day moving fruit and vegetable crop from producer to storage and from storage to market. The Interstate Commerce Commission's figures show that over 1,000,000 carloads of perishable fruits and vegetables are moved yearly in the United States. The average haul is 1,500 miles. Truck haulage is tremendous. Los Angeles, for instance, received 17,500 carloads by truck and 15,000 by rail in 1924, and motor traffic is growing.—Louisville Journal Courier.

There are about 4,500,000 more automobiles than telephones in the United States.

Johannesburg, South Africa, will have a railway station costing $3,000,000.



Santa Fe Machinery Apprentice Operating Boring Bar.

Do Your Own Printing and Save

A Short Line Economy

By C. L. Holland

A SAVING of 27 per cent in the cost of stationery forms —about $44,325—was recorded in the last fiscal year by a group of three short line railroads having headquarters at Atlanta, Ga. They own their printing plant.

These economical railroads are the Atlanta & West Point, the Western Railway of Alabama, and the Georgia Railroad. In 1913 the roads decided to print a few forms on Multigraph machines. Another was soon added. Later, realizing the possibilities and advantages of a privately owned printing plant, additional equipment and machinery was purchased.

The present equipment of the plant includes three Multigraph machines; one 17 by 22 Kelly printing press with automatic feed; one 12 by 18 job press with automatic feed; one 40-inch paper cutter; one folding machine; one wire stitcher; one punching machine with Graphatype for addressing envelopes and mailing out publications.

In comparing costs, J. S. Moss, in charge of stationery and printing for the group, says, "At one time we were behind with our work. We placed orders with outside printers for small quantities of 15 different forms. After paying for this work, we found that had we done the job in our plant, we would have saved 69 8/10 per cent."

Mr. Moss figures an average saving of 27 per cent on all stationery forms printed. Production from May, 1926, to April, 1927, was $44,325, which included 80 per cent of all printed stationery forms used by these lines.

By reasons of their purchasing power, blank forms, second sheets and mimeograph paper, is obtained at greatly reduced prices, such prices being the same as regular outside printers pay. The paper is purchased in mill sizes in ton lots, and cut to sizes desired.

Further saving is effected on all odd cuts of stock paper and obsolete forms of stationery by manufacturing it into scratch pads. All waste paper from different points on line of road is forwarded to Atlanta, and all old records that might be made into scratch pads is selected therefrom, the remainder of it being disposed of to the best advantage.

An important purpose of the plant is to print only such forms as it is known will effect a savings. A close check is made of comparative costs at all times. If it is discovered that the costs are greater than would be for outside work, the items constituting the costs are carefully checked and if nothing is wrong, they discontinue printing this form and purchase on the outside. Exceptions in such cases

In the Make-up End of the Printing Department of a Railroad Plant Turning Out Much of Its Own Stationery.

are where the question of service enters into it. If the work is needed quickly, the cost is not considered. When service is an important item, which often it is, the road can afford to pay the higher price.

The plant is operated as a separate unit, carried in a different account. The actual cost of every job is recorded. When taking stock the printing shop is taken separately, and the completed printing job is charged into the stationery account.

The plant occupies 2000 square feet of floor space in the general office building. The force consists of ten employes who work an eight-hour shift during the day, and one man works an eight-hour shift at night operating the larger press in order that the maximum capacity of the machine may be maintained.

All offices in the general office building have access to the addressograph to address outgoing mail on their regular mailing lists.

The plant, in addition to printing the usual and general forms of stationery, prints time table folders, official time cards, and publishes two magazines. One, the Courier, is the roads' house organ containing about 45 pages, published monthly. The other, the Agricultural Bulletin, contains about 60 pages and is published quarterly. Both of these publications are printed on a fine grade of enamel book paper with two and three-color covers, and are profusely illustrated. The former has a circulation of about 6500 copies, and the latter about 8000.

Watching the Printed Sheets Come From the Press in a Railroad Print Shop.

Politicians and Railroads

In days of old, politicians found much to warm the cockles of their hearts when assailing railroads. The response of the shouting audience was sincere even if the politician was not or talking like many men do when their ignorance is all out of proportion to their knowledge. But the day of the inefficient, even in politics, is passing. The railroads having nothing to conceal have come into the opening with the defense of publicity to make the operation of the lines better understood. In these days of waning political prestige the platforms of most meetings of consequence have a good representative of railroad men who know how to talk because of economic study and investigation they have made. They speak clearly and to the point.

American railroads in private ownership manned by railroad men have reduced their payrolls by about 200,000 employes, at the same time increasing their efficiency to the extent that their car loadings mounted from 42 million cars in 1921 to 53 million cars in 1926. The railroads are necessary for the proper development of the country, and the public is beginning to understand that they are doing this work out of their own great capacities and are doing it well without being rightly subject to the charge of extortion.—Seattle Daily Journal of Commerce.

We can learn something from almost everyone; how much more, therefore, can we learn from those above us in our calling.

Capital is what you and I have saved out of yesterday's wages.—Hartley Withers.

Don't waste your energy. Many a man isn't worth the time it takes to get the better of him.

Whalen, Agent of Americanization

Friend of Mexican Workers

By Lee McCrae

FLOCKING across the southern border come the Mexicans with their wives and children and dogs—and nothing else—seeking jobs and coveted wages. Well for them in days past that they have found at the end of the weary treking a fairy godfather, unfairy-like in physique but bigger in heart than any Santa Claus, W. H. Whalen, for 17 years superintendent of the Southern Pacific between El Paso and Santa Barbara, and still wielding a paternal hand over their destinies.

Whalen watched them straggle into camp, all their possessions in their arms, unable to ask intelligently for work, too weak from over-exertion and hunger to do it if given. He realized the vastness of their needs far better than they. Hear him tell the story!

"Out of pure humanity we had to practice the Salvation Army slogan 'Soup, Soap, and Salvation,' and exactly in that order. When the men were fed and rested sufficiently we put them in our construction gangs. To house the women and children we pressed derelict box cars into service, dismantled them of metal and wheels and placed them flat on the ground. Sometimes two placed slightly apart, the space between arched over and screened in made really comfortable homes. Then a whole camp of these bunk houses required sanitation, and concrete cisterns were filled by our tank cars bringing pure water from many miles.

"The 'Soap' part was supplied in a box car bath house divided in the center, one side with showers for men, the other for women and children, and how they reveled in them on hot dusty days! It was luxury and novelty and health.

W. H. Whalen

"More wonderful still to them was the hospital car I equipped for every camp, painted snow white inside, filled with cots, up to date fixtures, medical supplies, and a nurse in charge, authorized to call a doctor when necessary. All free to them. Many and many a wee Mexican opens its eyes to the light in these box car hospitals.

"You see," continues this fairy godfather enthusiastically, "a man and his family must be well and happy for him to do good work, whether he be a railroad president or a track layer. Anchorage is necessary for their well being, also for our interests; so I gave the families plots of ground, seeds and water for little gardens. At one time they had 26 acres of these in all, and this fresh food varying their age-old diet of tortillas, has done wonders for their health, I urged it upon the mothers, impressing them with the need for fresh foods that the children might develop as did the American born.

"Accompanied by an interpreter I would visit them, make friends, and discover their needs. One result was an ice house, half dug-out, half discarded ties, into which we sent a month's supply of ice. Amazingly soon they were saving pennies to buy an ice cream freezer in every household. Beans spell food; ice cream is pure luxury! This distribution cost us about 200 tons of ice a month, but was worth it.

"From vegetable gardens we progressed to flower gardens and drought resistant shrubs, so the permanent camps became habitable, even attractive. Appreciate them? I should say they do! Once fed and clothed, given decent home and wage for the first time in his life, the Mexican becomes a good worker. The women are especially eager for civilization; you never saw so much laundering, and their eagerness for the children to 'speak Americana,' be 'Americana' is pathetic. That is what the S. P. wants of them.

"Therefore came the schoolhouse, one in every camp where there are 15 children. The local county had charge, but we always pay half the teacher's salary. What to do for the children of the shifting construction gangs puzzled me until I solved it by adding a schoolcar to the train. The families of these movable workmen must live in cars on wheels, their home to be on a siding wherever the train was sent. So the village is 'tit, tat, toe, all in a row' with one on the rear flying an American flag—the precious school-car. Nor can Uncle Sam take any of the credit; it belongs entirely to the good old Espee.

"We take pains to select a timekeeper whose wife is capable of taking this special work. Always she finds the children keen to learn, and tremendously proud of their new advantages. And patriotic! It has amazed me.

"Besides, this car is used nightly for a session for the men, day laborers who want so much to speak and read English that they prod their bodies into an hour or so of study. Not a few of them, under these happier conditions, have started bank accounts, quit drinking and gambling, and stay at home more contentedly. To be sure there are domestic quarrels among these hot headed, untutored folk, but I would give each angry couple a month to make up the difficulties, and if when I next came with the supply train they were unreconciled I would move either husband or wife to another camp. Yes, it works.

"To further emphasize its interest in education and public welfare of its employes and others, the Southern Pacific gave the first money, $1,500, for schools in the now great Imperial Valley.

"But my chief joy and satisfaction, looking back over the big adventure, are found in the development of the children themselves. Not a few I have passed on to higher education, even diplomas, often moving a whole family for the sake of a boy or girl. O, but I have stories to tell that would gladden your heart!

"One of the saving graces for these people is their love for music. For years graphophones were ever going. Now it is radios. So at night, when the toil of the day is done, when the great flaming sun has blinked its last ray across the hot mesa, the tired people lounge outside the box car houses, and listen to sweet strains from miles and miles away. It quiets their quarreling, silences their swearing, and makes the world seem good and kind. The little ones climb up the brakeman's iron ladder on the old red car, spread their blankets upon the flat roofs, and lie down under the stars to sleep, thinking how nice it is to be an American.

"Do you wonder that I enjoy remembering my part in starting this, better than recalling the big deals, statistics and all that sort of thing that went over my desk? And you can guess my pride in my successors who are carrying on the job today?"

This leaf from Southern Pacific records is truly typical of the big man and the fine philanthropy in transportation circles today. Human sympathy is back of it all for Mr. Whalen adds:

"No Southern Pacific train is too fine to stop out in the desert to pick up a hurt laborer or his sick ones and carry them on to the nearest hospital. Wages are not all we owe in this world."

The Public is Careless

The Interstate Commerce Commission gives an analysis of the causes of train and train service accidents which shows that only 3.55 per cent of the fatalities to all classes of persons in 1925 were due to derailments, and only 1.95 per cent to collisions, a total of 5.4 per cent. Thirty-eight per cent were due to persons being struck or run over at places other than highway grade crossings; almost 34 per cent occurred at highway grade crossings; 7 per cent occurred to persons who were getting on or off cars or locomotives; 3.9 per cent were due to persons falling from cars or locomotives, and the remaining 7 per cent to a variety of causes.

The Dependable Man

The dependable man thinks and intelligently acts. No man has all the brains. The dependable man knows this and seeks the advice and cooperation of men who have been specially trained.

The dependable man does exactly what the management wants done. By his example he enlists the energy and earnestness of his fellow workers.

The dependable man is a burden-bearer and a load-lifter. He shoulders in silence his part of the program, and in doing this, he makes himself a friend of others and a favorite with worthy persons.

Erasmus Darwin, in a poem published in 1781, made this remarkable prediction:

"Soon shall thy arm, unconquered steam! afar
Drag the slow barge, or drive the rapid car."

This was written eight years after James Watt invented the steam engine.

—Wide World Photo.

Tramcars of a New Construction Now Used in Berlin.

Some Pages From An Old Book

Railways in 1887

By
W. W. Williams

What Changes Have Come in Forty Years on American Railways! Here We See the So-Called Dancing Generation in a Car Especially Made for Its Pleasure.

FORTY years, in some European country, is not a long time. In the United States such a period covers probably the most important part of railroad progress. Assuredly it spans the years in which government regulation grew from a few paragraphs to volumes so elaborate and intricate that few persons really know what, if anything, is not included in such restrictions.

This piece, however, has nothing to do with regulation. It is merely a collection of interesting paragraphs from an old railroad book—what we call old over here—entitled "American Railways," printed in 1888.

In 1829, when Ericsson's little locomotive "Novelty," weighing two and a half tons, ran a short distance at the rate of 30 miles an hour, a writer of the time said that "it was the most wonderful exhibition of human daring and human skill the world had ever seen." To-day trains weighing 400 tons thunder by at 75 miles an hour, and we hardly note their passage.

The statistics of ten leading English and ten leading American lines, given by Dorsey, show the following results:

1. The cost per year of the rations, wages, fuel of an American locomotive is $5,590; of an English locomotive, $3,080.

2. Average yearly number of train-miles run by American locomotive, 23,928; English locomotion, 17,539.

3. Yearly earnings: American locomotive, $14,860; English locomotive, $10,940, although the English freight charges are much greater than those of the United States.

A bureau of information is now to be seen in large passenger stations in which an official sits and with a Job-like patience repeats to the curiously inclined passengers the whole railway catechism, and successfully answers conundrums that would stump an Oriental pundit.

The energetic passenger agent spares no pains to thrust information directly under the nose of the public. He uses every means known to Yankee ingenuity to advertise his regular trains and his excursion business, including large newspaper headlines, corner posters, curbstone dodgers, and placards on the breast and back of the itinerant human sandwich who perambulates the streets.

The life of an engineer while making surveys, is not an easy one. His duties require the physical strength of a drayman and the mental accuracy of a professor, both exerted at the same time, and during heat and cold, rain and shine.

An engineer, once on a time, standing behind his instrument, was surrounded by a crowd of natives, anxious to know all about it. He explained his processes, using many learned words, and flattered himself that he had made a deep impression upon his hearers. At last, one old woman spoke up, with an expression of great contempt on her face, "Wall! if I knowed as much as you do, I'd quit ingineerin' and keep a grocery."

In a mountainous country, like Colorado, the problem is how to reach the important mining camps, regardless of the crookedness and increased length given to the line. The Denver & Rio Grande has been compared to an octopus. This is really a compliment to its engineers. It sucks nutriment from every place where nutriment is to be found. To do this it has been forced to climb mountains, where it was thought locomotives could never climb. In one place, called the Royal Gorge, the difficulties of blasting a road bed into the side of the mountain were so

great that it was thought expedient to carry the track upon a bridge, and this bridge was hung from two rafters, braced against the sides of the gorge. In surveying some parts of the lines the engineers were suspended by ropes from the top of the mountains and made their measurements swinging in mid-air.

At first the facilities for mail services were very limited. Postmaster General Kendall, in 1835, suggested that the Baltimore & Ohio might be asked to close in some portion of their baggage cars, a strong lock being placed on the apartment, to which only the postmasters at Washington and Baltimore should have keys. In the same report he adds: "If wheels can be constructed which can be used alike upon the railroads and the streets of the cities respectively, the department will furnish an entire car containing the mail to be delivered at one depot, and received at the other, asking nothing of the company but to haul it." It was even proposed at this time that the government should have its own locomotives, everything else on the road giving right of way to the mail train. This proposition was not adopted. The fear was expressed, however, that if the department did not have absolute control over the road, the people would have to depend on stage or other horse transportation for mail service. All these early troubles in time passed away, and, through concessions on both sides, the railways soon became the most important agent of the post office department.

It will perhaps interest some readers to know how much fuel a locomotive burns. This, of course, depends upon the quality of fuel, work done, speed, and character of the road. With freight trains consisting of as many cars as a heavy locomotive can draw without difficulty, the consumption of coal will not exceed from 1 to 1½ pounds of coal per car per mile if the engine is carefully managed. It takes from 15 to 20 pounds of coal per mile to move an engine and tender alone, the consumption being dependent upon the size of the engine, speed, grades, and number of stops. If this amount of coal is allowed for the engine and tender, and the balance that is consumed is divided among the cars, it will reduce the quantity for hauling the cars alone to even less amount than those given above.

And Here the Young People Are Having a Card Party While the Train Roars Through the Night.

In ordinary average practice the consumption is from 3 to 5 pounds per freight car per mile, without making any allowance for the engine and tender. With passenger trains, the cars of which are heavier and the speed higher, the coal consumption is from 10 to 15 pounds per car per mile. A freight locomotive with a train of 40 cars will burn 40 to 200 pounds of coal per mile, the amount depending on the care with which it is managed, quality of the coal, grades, speed, weather, and other circumstances.

The climbing capabilities of a locomotive upon smooth rails were not known until, in 1852, B. H. Latrobe, chief engineer of the Baltimore & Ohio, tried a temporary zigzag gradient of 10 per cent—that is 10 feet rise in 100 feet length, or 528 feet to the mile—over a hill about two miles long, through which the Kingwood tunnel was being excavated. A locomotive weighing 28 tons on its drivers took one car weighing 15 tons over this line in safety. It was worked for passenger traffic for six months. This daring feat has never been equalled. Trains go over 4 per cent gradients on the Colorado system, and there is one short line, used to bring ore to the Pueblo furnaces, which is worked by locomotives over a 7 per cent grade. These are believed to be the steepest grades worked by ordinary locomotives on smooth rails.

Among the readers of this volume there will be some who have reached the summit of the divide which separates the spring and summer of life from its autumn and winter, and whose first information about railroads was received from Peter Farley's "First Book of History," which was used as a school book 40 or 50 years ago. In his chapter on Maryland, he says:

"But the most curious thing at Baltimore is the railroad. I must tell you that there is a great trade between Baltimore and the states west of the Alleghany Mountains. The western people buy a great many goods at Baltimore, and send in return a great deal of western produce. There is, therefore, a vast deal of traveling back and forth, and hundreds of teams are constantly occupied in transporting goods and produce to and from market.

"Now, in order to carry on all this business more easily, the people are building what is called a railroad. This consists of iron bars along the ground, and made fast, so that carriages with small wheels may run along them with facility. In this way, one horse will be able to draw as much as ten horses on a common road. A part of this railroad is already made, and if you choose to take a ride upon it, you can do so. You will mount a car something like a stage, and then you will be drawn along by two horses, at the rate of twelve miles an hour."

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

DESPITE an expected seasonal increase in the volume of freight this fall, at which time of the year it is always the heaviest, no difficulty is expected by the railroads in meeting the transportation demands of the shipping public, according to a report submitted at the regular fall meeting held at the Blackstone Hotel in Chicago, September 22, of the board of directors of the American Railway Association by the car service division. The condition of freight cars and locomotives, the report said, is the best for any of the post-war years, while the general transportation situation so far as operation is concerned is highly satisfactory.

Actual loading of revenue freight for the first 35 weeks this year, from January 1 to September 3, was 34,888,203 cars, a decrease of 124,713 cars or .4 per cent compared with the same period last year but an increase of 957,508 cars or 2.8 per cent over this period in 1925. Loading of coal, merchandise and less than carload lot freight and miscellaneous freight, which accounts for approximately 81 per cent of the total number of cars loaded with all commodities, has been greater by about .9 per cent for the 35 weeks period than for the same period in 1926 and approximately 4.5 per cent greater than in 1925. Loading of other commodities which includes grain and grain products, live stock, coke forest products and ore have been less for the first 35 weeks in 1927 than for the corresponding period last year. With the exception of grain and grain products, this also holds true for 1925.

In respect to the transportation situation so far as the movement of the heavy fall traffic is concerned, the report said:

"The supply of box cars in all parts of the country has continued to be sufficient to meet all requirements, with a surplus in excess of demand. The movement of winter wheat has been handled without the slightest difficulty. Roads concerned in the movement of spring wheat are well prepared for any demand that may be made upon them. Fewer western box cars are on eastern and southeastern railroads than ever before at this time of the year, clearly indicating that these railroads are continuing their policy of complete co-operation with their neighbors in the West in the return of western box cars to meet seasonal demand in that territory.

"The ability of the railroads to take care of any demands made upon them during the remainder of the season in the movement of box car traffic is evident.

"Bituminous coal production in the calendar year up to September 3 amounted to 356,475,000 tons, which is only 6,227,000 tons less than during the corresponding period last year. Production since April 1 has been at the rate of about 8,200,000 tons per week or approximately 1,340,000 tons less than was being produced at this time last year, and is about 1,000,000 tons less than the estimated current consumption. Consumers' stocks of bituminous coal in storage as of July 1 is estimated at 62,000,000, a decrease of 13,000,000 tons since April 1, and compared with 39,000,000 tons in storage on July 1, 1926.

"Coal loading on the lines serving the Kentucky, Virginia and West Virginia fields has increased very materially in the recent past, and at present some of the lines serving those fields are loading more coal than at any time in their history. This has caused a general tightening in the car supply in those particular territories and action has been, and is being taken to add to the car supply. It is not believed serious difficulties will be experienced in protecting the requirements.

"Movement of Lake coal is progressing satisfactorily although somewhat lighter than at this time last year, due to the unprecedented volume of movement earlier in the season. Dumpings at lower Lake Erie ports for the season to date are slightly over 4,000,000 tons in excess of the same period last year, and no difficulty is expected in completing the seasons' program.

"Loading of sand, stone and gravel is running about five per cent heavier than similar loadings during the same period last year. The car supply is adequate for all requirements. Refrigerator cars are in good supply and arrangements are being made to fully protect requirements."

Cutting Down the Thefts

Losses due to robbery of freight on the railroads of this country were the smallest for the first six months in 1927 of any corresponding period on record according to reports just compiled by the Protective Section of the American Railway Association for the first half of the year.

Robbery losses in the first half of 1927 amounted to $638 041, a decrease of $84,464 or 11.6 per cent compared with the corresponding period in 1926. This also was a decrease of $5,725,432 or nearly 90 per cent below the first half of 1920, when such losses were the greatest in the history of the railroads.

Despite this reduction in the amount of claims paid for robbery, reports for the first six months show that for all claims growing out of loss or damage to freight shipments, the first half of the year amounted to $19,820,223, an increase of $736,219 or 3.5 per cent compared with the corresponding period in 1926.

P. R. R. Cuts Branch Service

Competition of private motor cars and buses caused officials of the Pennsylvania Railroad to announce the discontinuance late in September of local train service on several branch lines in Maryland, Delaware and New Jersey.

Reduction of local train service between Philadelphia and Harrisburg, beginning with the termination of Daylight Saving Time, when new schedules will go into effect, and between Philadelphia and Lancaster, was also announced.

I. C. C. to Report on Buses

The Interstate Commerce Commission expects to submit a report on motor transportation to congress at the opening of the next regular session, the chairman of the commission, John J. Esch, has stated. The commission is still working on the report of its investigation of the operation of motor buses and motor trucks by, or in connection or competition with, common carriers subject to the Interstate Commerce Act.

Rate Increase Postponed

The increase of about 20 per cent in freight rates on all classes of freight to Florida territory from the Pacific Coast, which railroads proposed to make effective last month, has been postponed temporarily by an Interstate Commerce Commission order.

The new schedules must be suspended until April 25 to allow an investigation into their reasonableness.

Shipments to all points in Florida

south of Jacksonville would have been affected on shipments from California, Oregon and Washington. The railroads would have made the raises by canceling the present through rates and requiring shippers to pay combinations of rates over the various roads. Illustrating the effect of suspended schedules the commission said that the present through rate from San Francisco to Tampa on first-class freight is $5.55 per 100 pounds, while the combination rates between the two points would be $6.65. The increases resulting in second and third-class and other freight classes from the new schedules would be proportionate.

Produce and fruit shippers of California protested the increases.

Wabash for New Comforts

Comfort of travelers in passenger coaches has long been a problem with railways. In ten new coaches now being delivered to the Wabash Railway the seats were designed by a group of eminent surgeons to reduce travel fatigue to a minimum. Another unusual feature of these coaches is self-starting windows with a new type of lock which prevents sticking. These coaches were constructed by the American Car and Foundry Co. at St. Charles, Mo.

Delivery also will be made soon by the same company of six chair cars with exceptionally large smoking rooms, four chair cars without smoking rooms and six combination passenger and baggage cars. Six additional combination passenger and baggage cars will be delivered later by the St. Louis Car Co.

The Pullman Company, in addition, is constructing de luxe equipment for the Wabash to be delivered soon. These include six dining cars, four lounge chair cars and two cafe cars. The dining cars and lounge cars are equipped with roller bearings, a feature of passenger equipment which is becoming popular.

The lounge cars are of a new type with the greater part of the car furnished much like the present day parlor car and in addition will have a convenient buffet for light refreshments. The interior finish will be similar to that on the Banner Blue Limited, Wabash crack Chicago-St. Louis train and will be lighted both with panel type and overhead lighting.

C & O Files a Brief

In a brief filed with the Interstate Commerce Commission by the Chesapeake & Ohio marking the final stage in the second effort by the Van Sweringen brothers of Cleveland to create a great trunk line system, the road submitted an argument in behalf of its proposal to unite stock control of its line with the Hocking Valley, Erie and Pere Marquette. The project was described as a definite step toward realization of the plan contemplated by congress for grouping all of the railroads of the country into line or in highly competitive and financially powerful trunk line systems.

The brief submitted answers to the criticisms of minority stockholders.

Milwaukee Plan Attacked

Pending plans for reorganization of the Chicago, Milwaukee & St. Paul were declared to be "essentially unsound, unfair to security holders and unjust to the public" in a brief filed with the Interstate Commerce Commission by contesting bondholders of the system.

The document, representing one of the last stages of a controversy over the Milwaukee's receivership which began in 1925, set forth the views of a committee headed by E. C. Jameson which holds $18,000,000 of the road's bonds.

Instead of allowing the railroad to pass out of court control the brief said the Interstate Commerce Commission should "continue the receivership until the security holders are enabled to prepare a new plan for reorganization."

What Was Under the Rug

Reports that the Hill railroad interests are seeking entry into California from the Northwest via Klamath Falls, Ore., and Westwood, Lassen county, have been revived with the filing of articles of incorporation of the Northern California Railroad Co. with secretary of state Frank P. Jordan.

The new company, capitalized at $1,000,000, with headquarters in San Francisco, plans the immediate construction of 31 miles of railroad between Crescent Mills, Plumas county, and Westwood. The line will connect with the Indian Valley Railroad at Crescent Mills and tie into the main transcontinental line of the Western Pacific at Plaxton, Plumas county.

The Northern California Railroad is a subsidiary of the Red River Lumber Co., with vast timber holdings in Lassen, Plumas and Shasta counties, and the Westwood-Crescent Mills link will give the company a new and far shorter outlet to Pacific Coast and eastern markets via the Western Pacific.

Cut of Four Hours in Running Time

A cut of six hours in travel time from Seattle to Los Angeles and reduction of four hours in time from Los Angeles to Seattle in train schedules, was announced by C. L. McFaul, assistant passenger traffic manager for Southern Pacific. Under the new schedule the West Coast, leaving Los Angeles at 6:05 p.m., will arrive in Portland at 8:35 a.m. the second morning, instead of 9:25 a.m. and will arrive in Seattle at 3:25 p.m., instead of 7:15 p.m. as at present.

The new schedule provides for connection of the Cascade limited train from Seattle and Portland with the Padre at Oakland Pier, so that a passenger may leave Seattle at 4:30 p.m. and arrive in Los Angeles at 9:45 a.m. the second morning—a schedule of forty-one hours and fifteen minutes from Seattle to Los Angeles.

Another Oregon Rail Deal

A great region in Southern and Central Oregon will be opened up for further railroad traffic through the sale of one-half interest in the Oregon, California & Eastern Ry. to the Great Northern Ry. by Robert Strahorn, Spokane capitalist. The Great Northern and the Southern Pacific, which owns the other half interest, will operate the Oregon road jointly and neutrally.

The railroad deal was culminated, it is understood, by payment of between $900,000 and $1,000,000 to Strahorn by the Great Northern, which has waged a long fight to get a line into Southern Oregon.

Additional construction by the Great Northern along lines planned by Strahorn for the O. C. & E., will be carried out, it is intimated.

The Oregon, California & Eastern is a 40-mile line running from Klamath Falls, Ore., to Sprague River in Southern Oregon. But on March 26 Strahorn filed with the Interstate Commerce Commission on behalf of the O. C. & E. an application for certificate of public convenience and necessity authorizing the construction of 143 miles more in Klamath and Lake counties, Oregon.

Close Down a Nevada Line

The Tonopah and Goldfield R. R. has applied to the Interstate Commerce Commission for permission to abandon approximately seven miles of line known as the "cut-off" between Mainline Junction and McSweeney Junction, Nev. The road to be abandoned has not been used for ten years, the application said, and there is no prospect that it will be needed. It was constructed to handle freight business from Goldfield to Mina in the boom days of Goldfield.

Fruit Rate Cut Delayed

An order, postponing until November 10 the reduction of rates on deciduous fruits other than apples from California to eastern portions of the United States, has been handed down by the Interstate Commerce Commission.

The commission originally granted

reductions in the fruit rates from California to the eastern half of the continent of 13 cents per hundred pounds and also made a reduction of 12 cents per hundred pounds on the rate from California to Rocky Mountain territory and the Southwest.

The new schedules would have gone into effect October 10, but the commission declared that a month's postponement had been allowed because of a petition of railroads for further time to contest the case.

Chicago Terminals to Merge?

Removal or relocation of hundreds of miles of railway tracks in congested industrial districts is contemplated in a plan to replace four Chicago passenger stations with two vast structures costing $150,000,000.

The city now has six passenger terminals—the North Western and Union stations, both comparatively new and used by six roads, and the Illinois Central, Grand Central, Dearborn and La Salle street terminals, consolidation of which into two stations is proposed. Twenty-two railroads use the four terminals embraced in the consolidation plan, including the Santa Fe, the New York Central, the Rock Island, the Wabash, the Pere Marquette, the Grand Trunk, the Illinois Central, the Chesapeake & Ohio and the Baltimore & Ohio.

The project also involves the straightening of the Chicago River, now under way, which when completed will open new area to streets and tracks and will enable elimination of circuitous trackage followed by several lines into their present terminals.

P. R. R. Installs Largest Scales

The Pennsylvania Railroad has installed in its freight yards at Altoona, Pa., a pair of track scales which are said to be the largest in service on any railroad for weighing carload freight. The scales have a capacity of 800,000 pounds each, it is said, yet the balances are so sensitive that the weight of a single person can be determined on them within five pounds.

A C & O Coal Line

Pursuant to authority obtained from the Interstate Commerce Commission, the Chesapeake & Ohio has acquired control, by lease, of the newly constructed railroad of the Chesapeake & Hocking Ry. Co., extending from Gregg, Ohio, to Valley Crossing, Ohio, and began September 16 to operate the same as a portion of its Northern subdivision, according to an announcement by W. J. Harahan, president. This new 63-mile railroad, which is a heavily ballasted, double track line, gives direct and physical connection between the Chesapeake & Ohio and the Hocking Valley Ry., and provides greatly increased facilities for an outlet for the coal originating along the Chesapeake & Ohio through the Columbus gateway over the Hocking Valley to the Great Lakes and to the great Northwest beyond.

C & O Car Movement Speedy

A daily average of 56.5 miles per car was made by the Chesapeake & Ohio in the movement of freight during August. This is almost six miles better than the record in July, which was 50.9, and is only three-tenths of a mile below the February record of 56.9. In computing the average movement of cars, account is taken of all freight cars in service, including those in transit, cars in process of being loaded or unloaded, cars undergoing or awaiting repairs and cars on sidetracks for which no load is immediately available.

Navy Air Program Large

The naval aviation building program for the fiscal year beginning July 1, next, just announced by Secretary Wilbur, includes 147 planes estimated to cost approximately $7,600,000.

The new craft will consist of 48 combined torpedo, bombing and scouting planes, 41 two-seater convertible land and sea observation planes, 20 amphibians, 25 patrol flying boats, 11 training planes for naval reserves and one experimental patrol flying boat and one three-engined monoplane.

In addition, the department expects to purchase 57 air rafts, 346 air-cooled Wasp engines, 156 whirlwind engines, three geared J-5-A engines and 100 float-type landing gears for training planes.

Bids had been received on some of the equipment and contracts are in course of preparation.

Belgian Railways Gain in August

Gross earnings of the Belgian National Railways for August totaled 251,491,000 francs after taxes, as compared with 248,601,000 francs in July, according to the New York agency of the Banque Belge pour l'Etranger. Of the August, 1927, gross earnings 74,806,000 francs was derived from passenger revenues, 173,380,000 francs from freight traffic and 3,305,000 francs from other sources.

Saving Money for Shippers

Western shippers saved more than one and one-half billion dollars during the last six years through reductions in railroad freight rates in that period, according to J. T. Saunders, freight traffic manager for Southern Pacific. For carrying one ton of freight one mile the western Class I railways, in 1920, received an average of 1.449 cents. Last year the average receipts for this service had dropped to 1.187 cents, a reduction of 18.1 per cent.

"These reductions in rates," Saunders said, "saved shippers an annual average of $266,410,000 each year since 1920, or a total of $1,598,462,000 for the six years, 1921 to 1926.

"The railroads have made these huge investments of new capital for improvements and equipment, despite the fact that railroad earnings have not reached the amount which the law recognizes they should receive. They have put this money into the railroad plant in the hope and belief that they will be accorded public support and will be permitted revenues which will support the investment."

Employes' Sons Win Awards

Two sons of Pennsylvania Railroad employes have won this year's Frank Thomson memorial scholarships established some years ago to give the sons of living or deceased employes an opportunity to get a technical education. Competitive examinations for these scholarships, embracing subjects corresponding to the entrance requirements of scientific departments of higher universities, colleges and technical schools, were held in June, 21 young men participating. The winners are: Gilbert Morgan Roddy of Bellevue, Pa., son of E. G. Roddy, clerk, office of general superintendent motive power, Pittsburgh, and Lucien Schofield Atkinson of Lansdowne, Pa., son of C. R. Atkinson, chief clerk to the chief of motive power, Philadelphia.

These scholarships, amounting to a yearly sum of $600 each, were created in 1907 by the sons and daughter of the late Frank Thomson, formerly president of the Pennsylvania Railroad Co., in memory of their father.

The memorial scholarship established at the University of Pennsylvania in 1920 by the Pennsylvania Railroad Women's Division for War Relief, Department No. 3, has been awarded for four years beginning with the fall term, 1927, to Richard V. Thayer, son of Edwin S. Thayer, clerk in the railroad's freight claim department at Philadelphia. This scholarship is a memorial to the freight traffic men of the Pennsylvania Railroad who gave their lives for their country in the World War, and also commemorates the relief work done by Department No. 3 among Pennsylvania Railroad soldiers and sailors and members of their families during the war period. Under the terms of the scholarship, the winner is entitled to pursue any course given by the University of Pennsylvania. Mr. Thayer selected the

course in mechanical engineering, and began work in September.

Daily Car Mileage Record

The average daily movement per freight car for the first seven months of 1927 was 29.8 miles, the highest mark ever attained in any corresponding period, according to reports filed by the carriers with the bureau of railway economics. This was an increase of one-half of one mile above the best previous average established in the first seven months of 1926. The daily average movement per car in July was 29.1 miles compared with 30.5 miles in July last year.

In computing the average movement per day, account is taken of all freight cars in service, including cars in transit, cars in process of being loaded and unloaded, cars undergoing or awaiting repairs and also cars on side tracks for which no load is immediately available. The average load per car for the first seven months in 1927 was 27.3 tons, an increase of three-tenths of one ton above the average for the first seven months in 1926. The average load per car for July this year was 27 tons compared with 27.6 tons in July last year.

Nearly 39 Billion Tons

The volume of freight traffic handled by the Class I railroads in July amounted to 38,382,108,000 net ton miles, the bureau of railway economics reports show. This was a decrease of 3,335,143,000 net ton miles or 8 per cent under July, 1926, when freight traffic was the greatest for any July on record.

All districts reported decreases in freight traffic in July compared with the same month last year, the eastern district showing a decrease of 8.5 per cent, the southern 5.3 per cent and the western 8.3 per cent.

For the first seven months in 1927, the volume of freight handled by the Class I railroads was the greatest for any corresponding period ever reported, amounting to 272,374,299,000 net ton miles. This was an increase of 3,524,330,000 net ton miles or 1.3 per cent above the corresponding period last year, which had previously marked the high record.

Railroads in the eastern district for the seven months period reported an increase of 1.7 per cent above the same period in 1926 while the southern district reported a decrease of 1.5 per cent. The western district reported an increase of 1.9 per cent.

Loree Plan Nearly Ready

Leonor F. Loree, chief sponsor of the merger of the Kansas City Southern, Missouri-Kansas-Texas and St. Louis Southwestern Railroads expects the report which Coverdale & Colpitts, engineers, have been preparing in connection with the revamping of the original plan, disapproved recently by the Interstate Commerce Commission, would be completed within a few days.

The completed report, a detailed analysis of the three roads and their interrelationship in the consolidation, will be given to the special committees which each road appointed to consider the new plan. When these committees have formulated new recommendations the directorates of all roads will pass upon them, and the new scheme will be taken to the commission.

C B & Q to Spend 4 Millions

The executive committee of the Chicago, Burlington & Quincy has authorized capital expenditures of $4,000,000, one-fourth of which is to be used to pay for 25 gas-electric cars. The remaining $3,000,000 is to be used in connection with the reconstruction of the Burlington's passenger yards at Chicago. This work has been necessitated by the straightening of the Chicago River. It is expected that the reconstruction will take about eighteen months.

"For the first twenty-one days of September," said Hale Holden, president of the Burlington, "our grain movement was 35 per cent ahead of last year, coal movement was down 41 per cent and miscellaneous freight was up 7 per cent. There will be a wheat crop of 150,000,000 bushels in Nebraska this year, one of the best in that state's history. I expect an unusually large movement of this crop across the Missouri River, probably 30 per cent. General business is holding up well in our territory and is about equal to last year. Any improvement in business conditions depends largely upon the termination of the soft coal strike."

Eastern Earnings Decrease

Chief among the reports of earnings in August and the first eight months of the year, just issued, were the statements of the New York Central and the Pennsylvania.

The New York Central's gross revenue for August declined from $35,200,000 in 1926 to $34,500,000 this year, while its net operating income decreased $933,208. For the eight months to August 31 its gross revenue declined to $258,700,000 this year from $261,700,000 in 1926, while its net operating income dropped from $47,500,000 last year to $43,400,000 this year.

The Pennsylvania reported for last August a gross income of $58,200,000, as compared with $62,300,000 in August, 1926, and net operating income of $10,200,000, against $11,700,000 last year. Its gross receipts for the eight months this year were $447,100,000, as compared with $458,300,000 in the like period of 1926, while its net operating income was $63,300,000, against $65,100,000.

Operations of the Baltimore & Ohio in August resulted in losses in both gross and net returns, while during the eight-month period the gross revenue was greater than in 1926, but the net income was less. The Southern Railway revealed decreases in all items. The Illinois Central reported an increase in eight-months' gross, but decreases in the other figures. The Missouri Pacific dropped back for both August and the eight months, while the Chicago & North Western showed increases in both gross and net receipts for August, but decreases for the eight months.

Air Mail to Cuba Soon

Opening of the United States first regular international air mail has been set for October 19, when the Key West-to-Havana service will be established. This link with Cuba is the first step toward a service for speeding up mail communications with Central and South America.

The Pan-American Airways, Inc., of New York, will operate the Key West-Havana service, having been awarded a contract by Postmaster-General New at 40½ cents a pound for all mail carried. The company is understood to have arranged with the Cuban government for the carrying of mail between Havana and Key West.

Extension of the service from Havana to British Honduras, Guatamala, Salvador, Honduras, Nicaragua, Costa Rica, Panama and Canal Zone on a tri-weekly basis is contemplated by the company. Such a service would expedite the transmission of mail and passengers by steamship connection at Panama, placing them in New York in about four days. Eight large flying boats are expected to form the fleet. They will be multi-motored and capable of a 3500-pound pay load.

Canadian National Gains

An increase in net earnings by the Canadian National Rys. during August is shown in a report issued. Gross earnings were $21,670,324, as compared with $21,059,374.91 in August, 1926. During the same period in 1927 the working expenses aggregated $17,576,025.55 which compare with $17,032,240.93 in August, 1926, an increase of 543,784.62.

The net earnings in August amount to $4,094,298.45, while in August, 1926, they were $4,027,133.98.

For the eight month period from Jan. 1 to Aug. 31 of the current year, the gross earnings of the system total $172,401,492, while in the similar eight month

period of 1926, the total was $167,799.18, an increase of $4,602,212.82, or 2.7 per cent.

Indianapolis Plea Dismissed

Complaint of the Indianapolis board of trade against the failure of railroads to make through rates via Indianapolis on grain and grain products has been dismissed by the Interstate Commerce Commission, which held that there was no ground for ordering routing via Indianapolis or modifying present charges.

A Big Liner Launched

The new California, 31,000-ton electrically operated steamship of the Panama-Pacific Co. launched at the yards of the Newport News Dry Dock and Shipbuilding Co., will make her first voyage westward through the Panama Canal, leaving New York for Los Angeles January 28, 1928. Many distinguished guests from New York, Washington and other parts of the United States saw her christened by the daughter of President Franklin of the International Mercantile Marine Co. of New York as a subsidiary company.

Two other sister ships, like the California, will follow and all will offer great opportunities for shipping large quantities of citrus fruits from California by ship for the first time through the Panama Canal to the eastern seaboard. Immense passenger travel is planned by these new steamers from New York to Los Angeles and San Francisco.

As the largest commercial vessel ever built under the American flag and the world's largest with electric drive, the California will challenge the attention of shipping men the world over.

The ship has eight decks that, with the floor of the lower hold, have a superficial area of 7.2 acres. The cubic volume of the hull and superstructure is 2,717,000 feet, equal to the living space in 270 eight-room dwellings of average size.

The outstanding novelty in the California is her driving machinery, which is unlike that in any other liner. She has no engines, such as are found in other liners, but derives her power from high-speed turbogenerators that transmit their electric energy by cables to two giant motors, attached directly to the shafts which drive the vessel's twin propellers.

Freight Loadings Increase

Loading of revenue freight for the week ended September 17 totaled 1,124,231 cars, an increase of 134,759 cars over the preceding week when freight traffic was reduced owing to the observance of Labor Day. The total for the week of September 17, according to reports filed by the railroads with the car service division of the American Railway Association, was a decrease, however, of 55,028 cars compared with the same week last year but an increase of 25,604 cars above that week in 1925.

Miscellaneous freight loading for the week totaled 447,156 cars, a decrease of 4,259 cars under the same week last year but 20,103 cars above that week in 1925.

Loading of merchandise and less than carload lot freight totaled 267,590 cars, a decrease of 1,792 cars below the same week last year and 3,034 cars below the corresponding week two years ago.

Twenty-One Useful Years

The Grip Nut Company of Chicago is celebrating its twenty-first birthday anniversary. This is an important event in a man's life, and it is of course, even more important in the life and business activities of a great industrial enterprise like the Grip Nut Company. In the case of a man, the twenty-first birthday marks his entry into business life, if he makes the right kind of start. With an industrial organization it means that the product turned out in past years is no longer to be considered on trial, but has made a place for itself among the concerns interested in its manufacture and its use. The Grip Nut Company points with some pride to the fact that 147 leading railroads now are using Grip Nuts, and that many of these railroads have been using their product with satisfaction to themselves and the makers for more than 17 years.

Railway Construction

Tracks and Yards

CALIFORNIA.—The Santa Fe has awarded a contract to Marsh Brothers & Hardenier, San Francisco, for moving about 150,000 cu. yd. of earth required in relocating the main line to provide for extensions to the east end of the yard at Barstow.

—The Southern Pacific has applied to the I. C. C. for authority to acquire the Lake Tahoe Railway & Transportation Company.

—The Western Pacific has applied to the I. C. C. for authority to acquire a line now owned by the Union Belt Railway of Oakland, and to construct about two and a half miles of track connecting its lines with the line to be purchased and the Alameda Belt Line.

CANADA.—The Canadian Pacific has awarded a contract to W. A. Dutton and F. Mannix, Winnipeg, for grading between Rosedale, Alta., and Bull Pound Creek, 33 miles. Another contract has been awarded to H. G. MacDonald, Edmonton, for grading between Rosemary, Alta., and Bull Pound Creek, 23 miles, with a 6-mile spur to Gem Colony.

—The Canadian National received tenders until September 26 for clearing, grading and installing culverts in a proposed storage yard to be constructed east of Current River, near Port Arthur.

ILLINOIS.—The Pennsylvania has awarded a contract to the Colianni & Dire Co., Chicago, for grading and track work in connection with the elimination of grade crossing at 47th street in Chicago.

INDIANA.—The Algers, Winslow & Western has applied to the I. C. C. for authority to build a line from Algers to a connection with the Big Four in Pike County with a branch to a connection with the Southern approximately 15 miles.

—The New York Central has awarded a contract to the Walsh Construction Co., Davenport, for a grade separation project at South Bend.

—The Lake Erie & Fort Wayne has been authorized to construct an extension of its line in Allen county, from its present southwesterly terminus, in a southwesterly direction, one mile, to the connection with the tracks of the Wabash. Estimated cost is $25,000.

MASSACHUSETTS.—The Quincy Market Cold Storage & Warehouse Co. is said to be planning private railroad tracks at Hanover and Commercial streets.

MINNESOTA.—The Cloquet & Northern Lumber Co. has awarded a contract to Campbell & Sheils, Cloquet, for 36 miles of logging railroad from Cascade Lake to Rose Lake on the Canadian border.

MISSOURI.—The Missouri Pacific has purchased a tract containing 103,000 sq. ft. at Spring avenue and Market street, St. Louis, for team tracks. The estimated cost of the improvement is $200,000.

NEW YORK.—The Long Island has closed bids for lowering its West Hempstead branch track to permit the construction of a bridge on the southern state highway, west of Lake View.

—The New York Central has awarded a contract to the Arthur McMullen Co., New York, for multiple tracking and duct lines at Fort Washington Park to cost about $200,000. Another contract has been awarded to the Walsh Construction Co., Syracuse, for third and fourth tracking from Garrison to Beacon.

—The Pennsylvania has awarded a contract to James F. Brogan & Co., Philadelphia, for grading and track laying of additional yard tracks at the American Railway Express Terminal at Long Island City, to cost $25,000. The New York state public service commission has issued an order for the elimination of four grade crossings in East Aurora. The plans for this work provide the raising of the grade of the railroad for a long distance, to cost around $678,490.

OHIO.—The Fairport, Painesville & Eastern has awarded a contract to the C. A. White Construction Co., for a 6-mile extension from Painesville. The work involves considerable grading, the elimination of a grade crossing and the construction of a tunnel under the New York Central.

—The Toledo & Cincinnati has been authorized to construct two extensions 4.3 miles, in Butler county, to cost $1,305,000.

TEXAS.—The Cisco & Northeastern has awarded a contract to Allhands & Davis, Dallas, for grading work in connection with a line between Breckenridge and Throckmorton, 35 miles. Contracts for bridges and trestles will be awarded soon. Laying of rail and other work will be done by company men.

Buildings and Structures

ALABAMA.—Demopolis. The St. Louis-San Francisco received bids until September 22 for a one-story brick combined passenger and freight station.

CANADA.—Rouyn, Que. The Nipissing Central has awarded a contract to Angus & Gordon, Ltd., North Bay, for a passenger station.

—Kelso, Sask. The Canadian National has awarded a contract to Duff, Flint & Co., Regina, for water supply facilities.

—Alberta. The Canadian National received tenders until September 26 for 15 section foremen's dwellings at various points in the Alberta, Manitoba and Saskatchewan districts; 12 tool houses at various points in the Manitoba and Saskatchewan districts, one third class, and one fourth class station in the Alberta district.

CONNECTICUT.—New Haven. The New Haven has awarded a contract to the Roberts & Schaefer Co., Chicago, for a 200-ton reinforced concrete, automatic electric coaling plant, and a cinder handling plant for immediate erection at Lamberton street.

FLORIDA.—Arcadia. The Seaboard Air Line has awarded a contract to the C. V. York Co., Raleigh, for a passenger station.

—Dade City. The Seaboard Air Line has awarded a contract to E. W. Parker, Tampa, for a combination freight and passenger station.

—Indiantown. The Seaboard Air Line is said to be planning a hotel.

ILLINOIS.—Chicago. The Burlington has received bids for extensions to seven stalls of its enginehouse at Western avenue.

—The Santa Fe has awarded a contract to Jerome A. Moss for a fruit unloading shed, to cost $20,000.

—The Rock Island has awarded a contract to the T. S. Leake Construction Co., Chicago, for a frame passenger station at Burlington to cost about $10,000.

—Nelson. The Chicago & North Western has awarded a contract to G. A. Johnson & Son for an extension to five stalls of its enginehouse.

—Roundout. The Milwaukee will construct a water treating plant with a capacity of 17,000 gallons an hour to cost $15,800.

INDIANA.—Bedford. The Chicago, Indianapolis & Louisville has awarded a contract to the T. S. Leake Construction Co., for a concrete passenger platform to cost approximately $7,000.

—South Bend. The New York Central is said to be preparing plans for a union passenger station.

—South Indianapolis. The city of Indianapolis has awarded a contract to Charles E. Jefferson, Indianapolis, for a flood prevention channel along the White River as the first step in the elevation of the Indianapolis Union line, and the construction of a new bridge. The railroad has announced that work on the elevation will be started within 30 days after approval by the city of a bond issue to finance the construction of the flood prevention channel.

—Terre Haute. The Pennsylvania has awarded a contract to the Seaboard Construction Co., Philadelphia, for the structural steel work on the Wabash River bridge, to cost $45,000. Another contract has been awarded to the Dravo Contracting Co., Pittsburgh, for a concrete slab deck for the new Wabash River bridge, and the removal of the old bridge at a cost of $60,000.

—Wellsboro. The Baltimore & Ohio has awarded a contract to Milo P. Hanke, Cincinnati, for water treating plants at Wellsboro and McCool to cost $34,000.

KANSAS.—Herington. The Rock Island has awarded a contract to Joseph E. Nelson & Sons, Chicago, for extensions to five stalls of the enginehouse, to cost about $20,000.

—Topeka. The plans of the Santa Fe for a viaduct at Banner Street have been temporarily postponed as a result of an application for an injunction filed in the district court by property owners who allege the new viaduct will cause their property to depreciate, and that no provisions have been made to reimburse them.

MARYLAND.—Frederick. The Pennsylvania is said to be contemplating a new passenger station.

MASSACHUSETTS.—Lowell. The Boston & Maine will construct a steel bridge.

—West Springfield. The Boston & Albany plans to erect a new power plant at its shops to cost about $450,000. This plant will be a steel frame building 114 ft. long, 50 ft. wide and 80 ft. high, and is to be ready for operation early in 1928.

MINNESOTA.—Minneapolis. The Great Northern has awarded a contract to the William Baumeister Co., Minneapolis, for a four-stall addition to the enginehouse at Taylor street, to cost about $30,000.

MISSISSIPPI.—Columbus. The St. Louis-San Francisco received bids until September 22 for a one-story combined passenger and freight station.

MISSOURI.—Mansfield. The St. Louis-San Francisco has awarded a contract to Grant Wyatt, Webster Grove, for a brick and stucco passenger station.

—St. Louis. The Terminal Railroad Association has awarded a contract to the Parker-Russell Mining & Manufacturing Co., St. Louis, for a reinforced concrete and brick power plant building at 3251 Scott avenue, estimated to cost $20,000.

The Missouri Pacific has awarded a contract to the Roberts & Schaefer Co., Chicago, for two two-track cinder handling plants. A contract for a three-story reinforced concrete combination boiler, tank and blacksmith shop, to cost $90,000, has been awarded to the Gillespie & Daly Construction Co., St. Louis.

MONTANA.—Roundup. The C. M. & St. P., is planning a water treating plant, to cost $16,000. Another plant will be constructed at Shawmut to cost $9,800.

NEW HAMPSHIRE.—Gerrish. The Boston & Maine has awarded a contract to the New England Construction Co., Springfield, for rebuilding a bridge to cost $25,000.

NEW JERSEY.—Franklin. The Erie is said to be planning to eliminate a grade crossing which involves constructing a viaduct across the lines of the Lackawanna and the Lehigh & Hudson.

—Glen Rock. The Erie has awarded a contract to Parker & Graham, Paterson, for work eliminating grade crossings.

—Perth Amboy. The Central of New Jersey has awarded a contract to the Anderson Construction Co., Newcastle, for a passenger station to cost about $166,000.

—Swartswood. The Erie has awarded a contract to the Bates & Rogers Construction Co., Chicago, for a bridge.

NEW YORK.—Clarks Mills. The New York Central has awarded a contract to William M. Ballard, Inc., Syracuse, for rebuilding a bridge.

—Elmira. The Lackawanna has postponed the awarding of bids for a railroad Y. M. C. A. building until next spring.

—Harmon. The New York Central has awarded a contract to the National Boiler Washing Co., Chicago, for a boiler washing system in the new enginehouse.

—New York City. The New Haven has awarded a contract to the Turner Construction Co., New York, for a brick and steel shed to provide facilities for the American Railway Express at the Harlem River to cost $400,000.

—Rochester. The New York Central has awarded a contract to the McMyler Interstate Co., Bedford, O., for an electric gantry crane.

—Syracuse. The New York Central has awarded a contract to the McMyler Interstate Co., Bedford, O., for an electric gantry crane.

NORTH DAKOTA. — Fargo. The Northern Pacific is remodeling the freight house so as to house the Fargo division headquarters to be moved from Dilworth.

—Mandan. The Northern Pacific has awarded a contract to C. Skooglun, St. Paul, for a reinforced concrete and brick power plant to cost $100,000.

OHIO.—Cleveland. The Cleveland Union Terminals has awarded a contract to the H. E. Culbertson Co., Cleveland, for excavating the eastern approach to the new passenger station. A contract for the reinforced concrete retaining wall to provide for the moving canal road outside of the tract selected as a site for the station and its trackage facilities has been awarded to the Hunkin-Conkey Construction Co., Cleveland. Bids are being received for the Eagle avenue ramp which will span the Wheeling & Lake Erie. The approach tracks to the new station will include a movable span over the Cuyahoga River. Construction of the station tracks and platforms will start early in 1928, following the razing of an office building now on the site.

—Lima. The Detroit, Toledo & Ironton is said to have purchased 100 acres for a new terminal. Additional land will be acquired for enginehouse and repair shops, construction of which is expected to start by January 1.

OKLAHOMA.—Ponca City. The Rock Island has awarded a contract to Rochard Sherbon, Ponca City, for a brick and concrete combined freight and passenger station to cost about $20,000.

—Sayre. The Rock Island has received bids for a one-story brick passenger station.

OREGON.—Eugene. The Southern Pacific is said to be preparing plans for a machine shop with additional track facilities and storehouses to cost approximately $261,000.

—Portland. The plans of the Oregon-Washington Railroad & Navigation Co. for a viaduct on Vancouver avenue have been approved by the Portland city council. The estimated cost of the project is $109 000, the railroad contributing $65,500 as its share of the expense.

PENNSYLVANIA. — Glenside. The Reading has awarded a contract to the T. F. Foley Construction Co., Pittsburgh, for grade crossing elimination work to cost $250,000. This company is said to be planning a steel bridge near Glenside, and another near Philadelphia.

—Pittsburgh. The Pennsylvania has awarded a contract to Austin Givens for the removal of buildings on Liberty and Penn avenues, 11th street, Spring Way and 13th street, to cost $34,000. A contract has been awarded to the McClintic-Marshall Steel Supply Co., Pittsburgh, for a new canopy on the north side of the train shed of the Union Station.

—Scranton. The Delaware & Hudson has awarded a contract to R. B. Porter & Son, Scranton, for a grade crossing elimination at Green Ridge and East Market streets.

—Tyrone. The Pennsylvania has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 250-ton capacity reinforced concrete two-track simplex automatic electric coaling plant, and a "R & S" gravity sand handling plant.

SOUTH DAKOTA.—Bonilla. The Milwaukee is planning a water treating plant with a capacity of 7,000 gallons an hour to cost $24,100.

TENNESSEE.—Nashville. The Tennessee Central has awarded a contract to the Roberts & Schaefer Co., Chicago, for a cinder handling plant which the Central will erect.

TEXAS.—Quitaque. The Fort Worth & Denver South Plains has closed bids for a passenger and freight station.

—Turkey. The Fort Worth & Denver South Plains has closed bids for a passenger and freight station.

VERMONT.—Burlington. The Central Vermont has awarded a contract to the Roberts & Schaefer Co., Chicago, for a cinder plant.

VIRGINIA.—Little Creek. The Pennsylvania has awarded a contract to the Arundel Corpn., Baltimore, for bulkheads, ferry racks, float bridge foundations, and masonry for two bridges.

WASHINGTON.—Bellingham. Plans have been prepared for a viaduct over the tracks of the Great Northern and the C., M. & St. P., at Chestnut and Bay streets. The cost, which is estimated at $100,000, will be borne jointly by the two railroads and the city of Bellingham.

—Seattle. The Milwaukee has been authorized by the federal court at Chicago to expend $333,700 for the extension of dock and warehouse and accompanying facilities. The improvements include the extension of the wharf, $65,200; extension of warehouse, $29,300; automatic sprinkler system, $40,000; office, waiting room and club for steamship employes, $24,000; oil facilities, pipe lines, tanks, retaining wall and spur track, $80,000.

The Northern Pacific has awarded a contract to the McEachern Construction Co., Seattle, for part of the work in connection with an extension to Pier 5. A contract has been awarded to Albertson-Cornell Brothers & Walsh, Seattle, for new storage bins and bulking facilities at the grain elevator, estimated to cost $100,000.

WEST VIRGINIA.—Wheeling. The Baltimore & Ohio is said to be planning a steel bridge.

WISCONSIN. — Sturtevant. The Milwaukee is planning a water treating plant to cost $18,000.

WYOMING.—Torrington. The Burlington is said to be preparing plans for a passenger station.

Locomotive Orders

Not a great deal of activity was apparent in September in the locomotive field, either as to inquiries or orders. The Detroit & Toledo Shore Line ordered four eight-wheel switchers from the American, and the Belt Railway of Chicago five eight-wheel switchers from Baldwin. The South African Railways inquired for one electric freight locomotive. The Erie ordered 15 tenders from Baldwin; the Waller A. Woodard Lumber Company of Cottage Grove, Ore., ordered one Prairie type from American Locomotives. The Mukden-Hailung Railways, through Mitsui & Co., ordered two Mikados from American Locomotives, and four of the same type from Baldwin.

Fewer locomotives were in need of repair on Class I railroads September 1

than at any time since the preparation of these statistics began in 1920, the car service division of the American Railway Association announced. The total number of locomotives in need of repair on that day, according to reports just filed by the carriers, was 8,502 or 13.9 per cent of the number on line. This was a decrease of 33 locomotives under the best previous record established on August 1, this year, at which time there were 8 535 or 14 per cent. The number of locomotives in need of repair September 1 was a decrease of 572 compared with the number of such locomotives on August 15, at which time there were 9,074 or 14.9 per cent.

Locomotives in need of classified repairs September 1 amounted to 4,592 or 7.5 per cent, a decrease of 284 compared with August 15, while 3,910 locomotives or 6.4 per cent were in need of running repairs which was a decrease of 288 compared with the number in need of such repairs August 15. Class I railroads, September 1, had 6,251 serviceable locomotives in storage compared with 6,451 on August 15.

Passenger Car Orders

Gas electrics of one kind or another led in passenger car orders in September. The Consolidated Railways of Cuba were reported inquiring for three sleeping cars but at the same time ordered four combination passenger and baggage gas motor cars from the Brill Company. The Lehigh Valley Railroad Co. ordered one gas electric rail motor car and one trailer from the American Car & Foundry Co., one gas electric rail motor car and two trailers from Bethlehem and one gas electric rail motor car and one trailer from the Osgood-Bradley Car Co. The Reading ordered five combination baggage and mail cars from A. C. F. and five combination baggage and mail cars from Bethlehem. At the same time this road was reported to be building two express horse cars in its own shops. The Delaware, Lackawanna & Western increased its order already given to the Pullman Mfg. Corpn. for one combination mail and baggage car. The Southern Railway was reported inquiring for one business car and one dining car; the Chicago Great Western for four combination baggage and mail cars; the Richmond, Fredericksburg & Potomac for one gas electric rail motor car; the Bolivian Government Railways for three steel underframe sleeping cars. The Southern Pacific ordered six combination baggage and mail cars from the Pullman Mfg. Corpn. and the Great Northern one combination passenger, baggage and mail gas electric from Brill. The Burlington was inquiring for 25 gas electric rail motor cars, and the Georgia & Florida was said to be looking for four sixty- or seventy-foot coaches, two combination passenger and baggage and five combination passenger baggage and mail cars. An unconfirmed report was heard that the Seaboard Air Line had placed an order with the Brill Co. for 10 combination gas electric passenger cars and nine trailers, to be used in local interurban service. In addition to these, it was said four gas electric cars are to be built for that company by the Electromotive Co., East Cleveland, Ohio. The Timken Roller Bearing Co. is to equip the cars with its bearings.

Freight Car Orders

Freight car business seemed to be a little more interesting in September than in the previous month, but at the same time a great deal of work, both building and rebuilding, appeared on the program to be done by railroads in their own shops. The Penn Coal Co. ordered 100 mine cars from Pressed Steel, and the South Penn Colliery 200 mine cars from American Car & Fdry. Co. The Carnegie Steel Co., was inquiring for from 16 to 24 hot metal cars and ordered 40 tank cars from A. C. F. The Illinois Central was said to be inquiring for two air dump cars; Buff Creek & Gauley inquired for three hopper cars; the Cudahy Packing Co., for 200 refrigerators. The Pere Marquette was looking around for from 500 to 1,000 box cars, and the Winston-Salem Southbound inquired for eight all-steel or composite caboose cars. The Lehigh Coal & Navigation Co. ordered one extension side dump car from the Clark Co., and the Louisiana & Arkansas ordered eight steel underframe flat cars from A. C. F. The Otis Steel Co. ordered three extension side dump cars from Clark; the American Steel & Wire Co. 20 extension side dump cars from Clark. The Solvay Process Co. ordered 30 class V tank cars and five 30-ton multi-tank cars, both from the American Car & Fdry. Co. The Northern Pacific was reported contemplating repairs on 500 to 1,000 box cars. That company placed an order for 200 flat car underframes from the Siems-Stemble Co. The Great Northern was reported continuing the car building program it has followed for several years. This program includes the underframing of 2500 freight cars and the building of 500 to 1,000 box cars and 150 flat cars a year. This work will be divided among the several shops of the company.

Class I railroads, September 15, had 161,968 surplus freight cars in good repair and immediately available for service, the car service division of the American Railway Association announced. This was a decrease of 13,736 cars compared with September 8, at which time there were 175,704 cars. Surplus coal cars, September 15, totaled 38,467, a decrease of 6,279 within approximately a week while surplus box cars totaled 88,951, a decrease of 7,256 for the same period. Reports also showed 16 560 surplus stock cars, a decrease of twelve cars below the number reported on September 8 while surplus refrigerator cars totaled 10,946, a decrease of 509 for the same period.

Freight cars in need of repair, September 1, totaled 141,038 or 6.2 per cent of the number on line, according to reports filed by the carriers with the car service division of the American Railway Association. This was a decrease of 7,308 cars under the number reported August 15, when there were 148,346 or 6.5 per cent. It also was a decrease of 20,358 cars compared with the same date last year. Freight cars in need of heavy repair, September 1, totaled 101,826 or 4.5 per cent, a decrease of 2,683 compared with August 15 while freight cars in need of light repair totaled 39,212 or 1.7 per cent, a decrease of 4,625 compared with August 15.

Bus and Truck Orders

The Cleveland Railway, Cleveland, has ordered 20 White 6-cylinder buses. This brings the company's quota to 1,000 vehicles including trucks. The American Car & Fdry. Motors Co., has an order from the New England Transportation Co. for 15 Newel type deck-and-a-half parlor coaches. The White Co. delivered 10 six-cylinder buses to the Public Service Transportation Co. of Newark, N. J., to be operated in Newark and vicinity. The White bus fleet now used in this service numbers 274. Ten 6-cylinder 29-passenger Mack buses have been delivered to the Toronto Transportation Commission, Toronto, Canada. Two Mack buses of the 4-cylinder type have been delivered to the Southern Pacific Motor Transportation Co. This company has ordered also 12 type Y 29-passenger, three type Z 29-passenger, and seven type X, 21-passenger Yellow coaches. Three 21-passenger city type Yellow coaches have been ordered by the Washington Railway & Electric Co., Washington, D. C. Delivery has been accepted on 61 Mack buses by the Public Service Transportation Co., a subsidiary of the Public Service Corpn. of N. J. Thirty-eight of these were 20-passenger 4-cylinder gas electrics and 23 were 29-passenger, 6-cylinder gas electrics. A great deal of activity was reported throughout the country in orders for buses for interurban work.

Changes in Personnel

Executive and Operating

J. S. Pyeatt, president of the Denver & Rio Grande Western, has also been elected president of the Denver Union Terminal Co., succeeding **J. H. Bradbury**, retired.

Edward M. Durham, Jr., vice president of the Missouri Pacific at St. Louis, has been elected to the newly created position of senior vice president.

W. S. Dwinnell, vice president of the Salem, Winona & Southern has been elected president. **S. W. Dwinnell** has been elected vice president. Headquarters for both at Minneapolis.

N. D. Ballantine, assistant to the president of the Seaboard Air Line at Baltimore, has resigned and has opened an office as consulting engineer on railway and motor transport matters, with headquarters in the Transportation building, New York.

F. S. Biays has been appointed assistant to the president of the Spokane, Portland & Seattle, with headquarters at Portland.

L. N. Bassett, general superintendent of the Wichita Falls & Southern, at Wichita Falls, has been elected vice president and general manager. The office of assistant manager has been abolished.

Walter J. Cummings, president of the Cummings Car & Coach Co., Chicago, has been elected president of the Chicago & West Towns Ry., Oak Park, succeeding the late ex-Judge **Willard M. McEwen**.

J. R. Blackhall, vice president and general manager of the Chicago & Joliet Electric Ry., has been elected general manager of the Chicago North Shore & Milwaukee, succeeding **John F. Egolf**, who resigned to become operating vice president of the Western United Gas & Electric Co., effective November 1.

S. S. Walker has been elected president of the Joliet & Chicago Ry.

Julius Theobald, formerly general superintendent of the Atlantic City Electric Co., has been appointed general manager of the Springfield Railway Co., Springfield, O., succeeding **P. E. O'Brien**, deceased.

C. C. Hine, Los Angeles, has been elected vice general chairman of the Pacific Coast Transportation advisory board.

Robert S. Binkerd, vice chairman of the committee on public relations of the eastern railroads has resigned to become a general partner in the stock exchange firm of J. H. Oliphant & Co. E. E. Loomis, president of the Lehigh Valley, who is chairman of the committee, said:

"The resignation of Mr. Binkerd as vice chairman of this committee, as of Oct. 1, 1927, was accepted with sincere regret. It is not planned to name a successor, but the work of the committee will be carried on by the present organization under the direction of the chairman, with J. M. Fitzgerald and H. H. Hertel as assistants."

C. L. Burpee has been appointed terminal trainmaster of the Atlantic Coast Line at Jacksonville, succeeding **Max Hair**, who has been assigned to other duties.

A. H. Slader and **R. J. Hammond**, former assistants to the vice president and general manager of the Boston & Maine, have been appointed assistants to the president. These appointments follow the recent resignation of **Dwight S. Brigham**, assistant general manager, and the abolishing of the position of general manager and assistant general manager. The duties of these positions are being taken over by the president.

S. L. Fee has been appointed superintendent of the Centerville division of the Burlington at Centerville, succeeding **H. W. Hamm**, who has retired at his own request after 45 years' service. **H. C. Murphy** has been assigned to the staff of the general manager. Mr. Murphy will handle special matters referred to him.

Richard C. Morgan, superintendent of terminals on the Canadian Pacific, with headquarters at Winnipeg, has retired under the pension rules of the company because of ill health.

J. E. Gibeault has been appointed superintendent of the Levis division of the Canadian National with headquarters at Levis, succeeding **E. L. Desjardins**, who has retired after 51 years' service with the railway. **James M. Davidson**, division engineer of the Portage division of the Manitoba district at Winnipeg, has been appointed assistant superintendent of the Gladstone, Harte, Oakland, Pleasant Point and St. Rose subdivisions of the Portage division, with headquarters at Portage la Prairie, succeeding **J. H. McDiarmid**, who has been appointed supervisor of yard operations of the Central region at Toronto.

C. H. Buford, assistant general manager of the C., M. & St. P. lines east with headquarters at Chicago, has been appointed acting general manager lines west of Mobridge, with headquarters at Seattle, succeeding **C. O. Bradshaw**, who has been granted a three months' leave of absence. **E. F. Rummel**, general superintendent, lines west, succeeds Mr. Buford at Chicago.

The office of car accountant of the Colorado & Southern has been consolidated with the office of superintendent of transportation, both under the jurisdiction of **G. B. Hoover**. **G. A. Nelson**, formerly car accountant, has been assigned to other duties.

John J. Mantell, resident vice president of the New York district of the Erie, with headquarters at New York, has resigned to engage in other business. **John M. Condon**, superintendent of the New York district with headquarters at Jersey City, has been appointed general manager of that district with the same headquarters. **Alva C. Elston**, assistant to the resident vice president at Jersey City, has been appointed superintendent of New York division and side lines of the New York district. **John T. Gallagher** has been appointed manager of station service, with headquarters at New York.

J. H. Hustis, Jr., assistant to the vice president of the New York Central at New York, has been appointel manager of the New York Central building at Park avenue between 45th and 46th streets. He will have charge of all matters relating to the leasing, maintenance and operation of the building.

The jurisdiction of **H. L. Stonecifer**, superintendent of the Sandusky division of the Nickel Plate, has been extended to include both the Sandusky and Fort Wayne divisions. His headquarters has been moved from Lima to Muncie.

W. F. Brooks, assistant trainmaster on the Panhandle division of the Pennsylvania at Scully, has been transferred to Newark, Ohio, a newly created position. **J. F. Allenspaugh**, assistant trainmaster on the Panhandle division at Carnegie succeeds Mr. Brooks at Scully.

J. N. Sparks, superintendent of the Salem Winona & Southern at West Eminence has been appointed general manager, with headquarters at the same point.

Financial and Legal

J. L. Lenihan has been appointed general auditor of the Mississippi Southern, with headquarters at Chicago, succeeding **C. M. Thomas**, deceased.

J. C. Whitmarsh, auditor of the Bastrop & Lake Providence, has also been elected vice president of the Salem, Winona & Southern. **L. M. Rocheford** has been elected treasurer with head-

quarters at Minneapolis, succeeding **J. D. Ferguson,** whose headquarters was at St. Louis. **James B. Dwinnell** has been elected secretary with headquarters at Minneapolis, succeeding **J. P. Towery,** whose headquarters was at Shreveport.

Purchases and Stores

H. P. McQuilkin, formerly general storekeeper of the Baltimore & Ohio, has been appointed assistant purchasing agent with headquarters at Baltimore.

H. R. Duncan, traveling storekeeper for the Burlington, has been appointed superintendent of timber preservation with headquarters at Galesburg, succeeding **J. H. Waterman,** resigned. Other appointments are: **Geo. A. Goerner,** traveling storekeeper with headquarters at Chicago; **John Maier,** storekeeper at Aurora; **R. E. Kelly,** storekeeper at Galesburg; **A. G. Swanson,** storekeeper at West Burlington.

A. M. Gage, assistant general storekeeper of the Michigan Central at Detroit, has been appointed general storekeeper, succeeding **B. W. Griffith,** transferred. **H. A. Paar,** division storekeeper at Detroit succeeds Mr. Gage. **Walter C. Oke,** chief clerk to the division storekeeper at St. Thomas, Ont., has been appointed division storekeeper succeeding **F. V. Tenkonohy,** who has been transferred to West Detroit.

The Missouri Pacific has made the following appointments: **M. E. Baile,** district storekeeper with headquarters at St. Louis; **E. A. Porter,** division storekeeper with headquarters at Monroe: **W. R. Caldwell,** division storekeeper with headquarters at Kansas City.

F. I. Foley, assistant general storekeeper of the New Haven, has been appointed general storekeeper, succeeding **E. H. Price,** resigned.

Traffic

J. N. Gall, district manager of the Boston & Maine at Worcester, has been appointed assistant general freight agent in charge of the company's enlarged system of off-line agencies in this country and in Canada, with headquarters at Boston.

Robert Surgeon has been appointed freight claim agent of the Canadian National at Montreal, with jurisdiction from Cochrane, North Bay, Danforth and east to River Du Loup and Monk. Scotia Jct., to Depot Harbor, and Orillia to Midland, also the lines in Vermont, New Hampshire and Maine.

The Chicago Great Western has made the following changes and appointments: **Henry E. Bulla,** general agent at Des Moines, succeeding **Marshall B. Craig,** resigned; **Eugene M. Peck,** general agent, passenger department, at Omaha; **Conrad McGougan,** district passenger agent at Kansas City.

The Canadian Pacific has made the following changes and appointments: **H. A. Plow,** general freight agent of the western lines at Winnipeg, succeeding **C. E. Jefferson,** previously appointed assistant freight traffic manager of the western lines; **A. T. McKean,** assistant general freight agent at Vancouver; **R. W. Drew,** division freight agent at Calgary; **K. Elliott,** division freight agent at Regina; **G. A. Staples,** district freight agent at Edmonton. **S. G. Porter,** assistant manager of the department of natural resources at Calgary has been appointed manager, succeeding **P. L. Naismith,** resigned. **Robert Johnson** has been appointed assistant general passenger agent of the eastern lines, with headquarters at Montreal, succeeding Fred C. Hopkins, retired.

C. A. Hunt, chief of the tariff bureau of the Michigan Central at Detroit, has been appointed assistant general freight agent of the Chicago & Illinois Midland with headquarters at Chicago. Mr. Hunt will have charge of tariffs, divisions and rate legislation and will replace **R. S. Sneed** and **L. E. Butler** who have been assigned to other duties.

A. C. Dick has been appointed general agent of the Denver & Rio Grande Western at Trinidad, succeeding **H. G. Best,** promoted. **O. A. Kellogg** has been appointed general live stock agent at Denver, succeeding J. R. Mahon, deceased.

The office of general freight and passenger agent of the De Queen & Eastern and the Texas, Oklahoma & Eastern at De Queen has been abolished following the resignation of **D. E. Crawshaw,** who occupied that position.

The Erie has made the following changes and appointments: **Harry W. VonWiller,** general agent at Springfield, O.; **R. E. O'Grady,** perishable fruit agent with headquarters at New York; **Furman F. Moore,** commercial agent at Indianapolis; **Joseph A. Russell,** commercial agent at Seattle.

C. N. Christopherson, traveling freight and passenger agent of the Great Northern with headquarters at Vancouver, Wash., has been appointed general agent with headquarters at Klamath Falls.

The Lehigh Valley has made the following changes and appointments: **J. F. Andrews,** assistant general passenger agent at 110 West 42nd street, New York, has been transferred to the general office at 143 Liberty street, New York; **S. W. Gafner,** assistant general passenger agent at Buffalo has been transferred to New York to succeed Mr. Andrews; **H. Martens Jr.,** division passenger agent at Newark, succeeds Mr. Gafner at Buffalo, and **K. H. Hopper** succeeds Mr. Martens at Newark.

W. D. Burch, general agent of the Louisiana & Arkansas at Oklahoma City, has been transferred to Tulsa to take charge of the newly opened office at that point.

J. Roy Almand, general eastern passenger agent of the Louisville & Nashville at New York has been appointed division passenger agent at Cincinnati, succeeding **F. D. Bush,** deceased. **Lee A. Binkley,** formerly joint traveling passenger agent of the L. & N. and N. C. & St. L. at Miami succeeds Mr. Almand as general eastern passenger agent.

H. L. Schaeffer, chief clerk in the passenger department of the Missouri Pacific at St. Louis, has been appointed assistant general passenger agent with the same headquarters.

E. D. Disque, traveling passenger agent for the New York Central at Memphis, has been appointed general agent of the passenger department for Oklahoma City and Tulsa, succeeding **C. L. Holloway,** who has retired because of ill health.

C. H. Hagerty, division passenger agent of the Pennsylvania at Louisville, has been appointed general agent with the same headquarters. **L. G. Russell** has been appointed district passenger agent with headquarters at Louisville

The Seaboard Air Line has made the following changes and appointments at the Atlantic office: **J. R. Cooke,** commercial agent; **W. W. Miller, E. L. Setzer, T. S. Lawson,** city freight agents; **Hudson Ashley,** traveling freight agent. **W. H. Higginbotham,** formerly city freight agent, has been assigned to other duties. Other appointments are as follows: **F. P. Medford, Jr.,** district freight and passenger agent at Fort Lauderdale; **W. P. Hickey,** commercial agent at Macon, succeeding **E. H. Finney,** resigned to accept service with another company; **J. T. Carter,** district freight agent at Savannah; **H. G. Glaiber,** assistant general freight agent at Savannah, succeeding **R. W. Daniel,** deceased. The office of commercial agent at Savannah has been abolished.

A. W. Gill, assistant general freight agent of the Southern, lines west, with headquarters at Cincinnati, has been appointed general freight agent with the same headquarters, succeeding **F. S. Reigel,** who has resigned to engage in other business. **T. J. Logan** succeeds Mr. Gill as assistant general freight agent.

The Union Pacific has made the following changes and appointments: **F. P. Stafford,** acting general agent at Des Moines; **R. E. Drummy,** general agent at Santa Ana, succeeding **C. S. Browne,** transferred; **S. C. Frost,** general agent at Santa Monica; **T. I. McGrath,** district freight and passenger agent at Tacoma.

Mechanical

W. W. Wickline has been appointed road foreman of engines, Sewell Valley sub-division of the Chesapeake & Ohio, with headquarters at Rainelle, succeeding **A. M. Simms,** assigned to other duties.

L. K. Sillcox, general superintendent of motive power of the C., M., & St. P., with headquarters at Chicago, whose leave of absence expired September 13, has resigned from the service of the company, effective on that date. The Milwaukee has made the following changes and appointments: **R. W. Anderson,** superintendent of motive power, system, with headquarters at Milwaukee; **H. W. Williams,** assistant superintendent of motive power, lines west, with headquarters at Tacoma; **K. F. Nystrom,** superintendent car department, system, with headquarters at Milwaukee; **J. A. Deppe,** assistant superintendent car department at Milwaukee; **F. D. Campbell,** assistant superintendent car department at Tacoma. The titles of master car builder and assistant master car builders have been discontinued.

E. B. Hall, superintendent of motive power and machinery of the Chicago & North Western, with headquarters at Chicago, has been appointed general superintendent of motive power and machinery, succeeding **H. T. Bentley,** who has retired under the pension rules of the company. Mr. Hall is succeeded by **H. L. Harvey,** assistant superintendent of motive power and machinery.

C. J. Bodemer, assistant superintendent of machinery of the Louisville & Nashville at Louisville, has been appointed acting superintendent of machinery with headquarters at the same point.

M. A. Smith, assistant superintendent of motive power of the Pittsburgh & Lake Erie and the Lake Erie & Eastern at McKees Rocks, has been appointed superintendent of motive power succeeding **David J. Redding,** retired. **Karl Berg,** shop superintendent at McKees Rocks, succeeds Mr. Smith as assistant superintendent of motive power. **H. Courtney,** mechanical engineer at Pittsburgh, has been appointed shop superintendent at McKees Rocks, and **C. H. McConnell,** electrical engineer at Pittsburgh has been appointed mechanical engineer.

H. C. Quarles, master mechanic of the West Florida division of the Seaboard Air Line at St. Petersburg, has been transferred to the South Florida division, with headquarters at Arcadia, succeeding **F. S. Markett** who has resigned. **A. H. Whittaker,** general foreman in the locomotive department at Portsmouth succeeds Mr. Quarles. **W. W. Payne** has been appointed road foreman of engines of the Alabama division with headquarters at Savannah, succeeding **A. E. Hopkins,** deceased.

Civil

F. J. Bishop, engineer of maintenance of way of the Ann Harbor at Owosso, Mich., has been appointed engineer in charge of signals, bridges and buildings of the Toledo Terminal. The office of the chief engineer has been abolished following the resignation of **J. Wanbecq,** who occupied that position.

F. Lee, engineer of maintenance of way of the Canadian Pacific at Winnipeg, has been appointed district engineer of the British Columbia district, with headquarters at Vancouver. **E. R. Milledge,** roadmaster on the western region at Edson, Alta, has been appointed division engineer of the Portage division with headquarters at Winnipeg.

B. T. Anderson, superintendent of signals of the Chesapeake & Ohio at Richmond, has resigned to become assistant vice president of the Union Switch & Signal Co. **C. A. Taylor,** assistant superintendent of signals at Richmond, has been appointed signal engineer with the same headquarters. The position of superintendent of signals has been abolished. **T. S. Pattison** has been appointed assistant division engineer at Chillicothe.

D. C. Barrett, assistant division engineer of the Wisconsin division of the Chicago & North Western, has been appointed acting division engineer of the Minnesota division, with headquarters at Winona, succeeding **T. J. Irving,** who has been granted leave of absence.

B. Blowers, assistant division engineer of the Erie at Dunmore, has been appointed division engineer at Jersey City succeeding **S. J. Malloy,** resigned. **F. J. Hoagen** has been appointed assistant division engineer at Rochester succeeding **F. Sabbott,** who succeeds Mr. Blowers at Dunmore.

C. S. Weatherill, assistant engineer on the Minneapolis & St. Louis at Oskaloosa, has been appointed track supervisor in charge of the third district, central division, at Estherville, succeeding **E. M. Wilkin,** resigned. **L. V. Tyner** succeeds Mr. Weatherill at Oskaloosa.

The Pennsylvania has made the following promotions: **C. L. Barnaby,** engineer maintenance of way, northern division; **E. O. Wood,** division engineer, Chicago Terminal division; **R. P. Graham,** division engineer, Buffalo division; **H. C. Johnson,** engineer maintenance of way, eastern Ohio division; **F. M. Graham,** engineer maintenance of way, Lake division; **T. L. Doyle,** division engineer, Columbus division; **J. H. Shilling,** division engineer, Grand Rapids division; **T. E. Nestor,** division engineer, Panhandle division; **J. C. Poffenberger,** division engineer, Conemaugh division; **Louis P. Struble,** assistant to the chief engineer, central region.

Obituary

Horace B. Beale, Jr., president of the Parkesburg Iron Co., Parkesburg, Pa., died on September 6, aged 57. He was born at Hibernia, where his father, Horace A. Beale, who for years was a prominent iron master, operated the Hibernia Iron Works before moving to Parkesburg in 1872. Mr. Beale began work with the Pennsylvania Steel Co., Steelton, in 1892, and in 1893 came to the Parkesburg Iron Co. where, after thoroughly learning the manufacture of charcoal iron, he became vice president in 1898 and president in 1900.

During his administration of the Parkesburg Iron Co., a tube mill, for manufacturing charcoal iron into boiler tubes, was built in 1908, where quality being the first consideration its product was favorably known throughout this country and abroad. In addition to his interest in the Parkesburg Iron Co., Mr. Beale was prominent in the republican party, having represented his district at five national conventions; he was one of the early radio inventors, having operated one of the first amateur broadcasting stations, and through his love of fairness in sports, and many other activities, was widely known.

Robert W. Daniel, assistant general freight agent of the Seaboard Air Line with headquarters at Savannah, died September 5 at Columbus, Ga., following an attack of acute indigestion.

Thomas A. Graham, who, as general freight and passenger agent for the Southern Pacific at Los Angeles from 1903 to 1911, is credited with having been a vital factor in the upbuilding of Imperial Valley from a desert to a great producing center, died at Sydney, Australia, from influenza on September 26, aged 63. Mr. Graham was vice president and general manager of the Pacific Mail Steamship Co., having accepted that position after rising to the post of assistant freight traffic manager of the Southern Pacific.

W. P. Hood, superintendent of the Knoxville & Augusta, the Knoxville & Bristol and the Tennessee & Carolina Southern with headquarters at Knoxville, died at the Knoxville general hospital September 13.

Elwood L. Wilson, assistant passenger traffic manager of the New Haven at Boston, died at his summer home in Plymouth, September 1, aged 55.

Bertram G. Work, president of the B. F. Goodrich Co., Akron, died of paralysis of the heart, after an illness of a few hours.

Supply Trade Notes

The **American Steel & Wire Co.**, is taking bids for a one-story plant at De Kalb.

The **Blaw-Knox Co**, **Pittsburgh**, will move its New York office from 30 East 42nd street to the Canadian Pacific building, 342 Madison avenue, October 1.

F. T. Whitney, for the last three years in charge of the Philadelphia territory for the **Cohoes Rolling Mill Co.**, has been appointed sales manager, with headquarters at Cohoes.

M. L. Bardach, formerly president of the **Bardach Iron & Steel Co.**, Norfolk, has been appointed sales manager for the steam railroad department of the **Columbia Machine Works & Malleable Iron Co.**, Brooklyn.

The **Chicago Pneumatic Tool Co.**, New York City, has announced the appointment of **J. C. Fitzpatrick** as district manager of sales at 1241 East 49th street, Cleveland, succeeding **J. L. Westenhaver**, who has resigned to enter business for himself.

The **Cutler Hammer Manufacturing Co.**, has moved its Cleveland office from the Guardian Trust building to the Guaranty Title building.

H. V. Greenwood, formerly sales manager of the **Baldwin Chain & Manufacturing Co.**, Worcester, has been appointed representative for the **Foote Brothers Gear & Machine Co.**, in Michigan with headquarters in Chicago.

T. F. Barton of the central station engineering department of the **General Electric Co.**, at Schenectady, has been appointed engineer of the New York district with headquarters at 120 Broadway, New York. **J. B. Bassett** of the New York office has been appointed executive engineer of the New York district.

Harry Hough, vice president and comptroller of the **B. F. Goodrich Co.**, Akron, has been elected president, succeeding **Bertram G. Work**, deceased. **D. M. Goodrich** has been elected chairman of the board, and **J. D. Tew** has been elected first vice president, succeeding **Lorenzo D. Brown.**

The **Harnischfeger Corpn.**, Milwaukee, has opened a branch office at 524 Buder building, St. Louis, in charge of **L. J. DeHoney.** The **Johnson-Beckwith Equipment Co.**, Davenport, has been appointed representative for Iowa and the **Northwest Equipment Co.**, Billings, representative for Montana.

The **Heald Machine Co.**, Worcester, has acquired all the assets of the grinding machine division of the **Giddings & Lewis Machine Tool Co.**, Fond du Lac, including drawings, patterns, jigs, tools and fixtures, inventory of machines and parts, patent rights and good will. The Giddings & Lewis Co. will in future devote its entire efforts to the manufacture and development of horizontal boring, drilling and milling machines.

L. M. Cauble, formerly sales manager of the **Dealers' Equipment Co.**, Chicago, has joined the sales force of the **Highway Trailer Co.**, Edgerton, in its Chicago office.

Robert E. Kinkead, chief engineer of the welding division of the **Lincoln Electric Co.**, Cleveland, has resigned to engage in consulting engineering in connection with electric arc welding, with headquarters at Cleveland.

The **Manganese Steel Forge Co.**, Philadelphia, has opened an office at 1335 Old Colony building, Chicago, in charge of **W. H. Potter**, formerly of the Philadelphia office.

The **Alexander Milburn Co.**, 1416-1428 West Baltimore street, Baltimore, manufacturers of welding and cutting apparatus, portable carbide lights, oil burners and preheaters, and paint and lacquer spraying equipment has organized an office in Boston to be known as The **Alexander Milburn Sales Co.**, Wiggin Terminals building, 50 Terminal Street, Boston, under the supervision of M. B. Crouse and G. B. Malone, experienced executives in welding and cutting equipment. This office will handle the sale and distribution of Milburn equipment throughout the New England states.

C. J. Martin has joined the forces of the **National Pneumatic Co.**, as mechanical expert in the western territory with headquarters at Chicago.

The **Morton Manufacturing Co.**, Chicago, has recently concluded arrangements for the establishing of two important foreign branches, one with the **Lyman Tube & Supply Co.**, Montreal, to handle Canada and Newfoundland, and the other with **A. & S. Ash Brothers**, a large railway equipment firm at Johannesburg, South Africa. The Morton organization is also considering arrangements calculated ultimately to provide the company with a world-wide distribution for its products. **Malcolm S. Simpson**, Suite 1479, Starks building, Louisville, has been appointed direct sales representative (railroad division) in the territory surrounding Louisville.

The **Ohmer Fare Register Co.**, Dayton, has opened branch offices in the Insurance Exchange building, Detroit; 1635 Vine street, Philadelphia; 1428 Brush street, San Francisco and 954 South Flower street, Los Angeles.

The Strauss **Bascule Bridge Co.**, Chicago, has changed its corporate title to the **Strauss Engineering Corpn. Joseph B. Strauss** is president, and **Charles A. Ellis** and **Clifford E. Paine** are vice presidents.

Dr. John Johnston has been appointed director of the new department of research and technology for the **United States Steel Corpn.**

B. T. Anderson, formerly superintendent of signals of the Chesapeake & Ohio, has been appointed assistant to the vice president of the **Union Switch & Signal Co.**, Swissvale. Other appointments are: **Walter P. Allen**, eastern manager, with headquarters at 150 Broadway, New York (Mr. Allen's former position as resident manager, eastern district, has been abolished); **H. W. Griffin** and **H. McCready**, assistant eastern managers; **S. J. Turreff**, assistant resident manager, southwestern district, with headquarters at St. Louis; **C. M. Wheeler**, formerly supervisor of telegraph and signals, Pittsburgh division, Pennsylvania Railroad, has been appointed sales engineer in the eastern district.

The **Wade Engineering Co.**, Los Angeles, representative of the **Lincoln Electric Co., Cleveland**, has moved its northern office from Oakland to 533 Market street, San Francisco.

R. L. Wilson, works manager of the East Pittsburgh works of the **Westinghouse Electric & Manufacturing Co.**, has been appointed assistant to the vice president and general manager. **J. M. Hipple**, manager of the motor engineering department succeeds Mr. Wilson as works manager.

The **White Co.**, Cleveland, has opened a new branch sales and service building at 435 East 20th street, Los Angeles. The building, which is of cement and brick construction and cost $500,000, has 132,000 sq. ft. of floor space and is equipped with the most modern shop machinery and service facilities.

The **Whiting Corpn.**, Harvey, has awarded a contract to **Schmidt Brothers**, Chicago, for a foundry addition 70 ft. by 160 ft.

F. M. Young, former vice president and general manager of the **Racine Radiator Co.**, has organized and been elected president of the **Young Radiator Co.**, Racine, to manufacture heavy-duty radiators, including bus, truck, tractor, power unit and various industrial types. **J. J. Hill** formerly associated with the Racine Radiator Co., has been appointed sales manager.

The Railroad's Community Value

This essay, written by Mabel Alice Richmond of Rotterdam Junction, N. Y., received the first prize in the recent contest held by the Boston & Main R. R. among children of its employes for the best essay on "The Value of the Boston & Maine Railroad to the Community." The winner, who is a junior in Woestina High School of Rotterdam Junction, is the daughter of Clyde J. Richmond, freight conductor. The second and third prizes also went to girls. The judges awarded honorable mention to six other contestants, of whom three were girls.

The manifold benefits rendered the many communities served by the Boston & Maine R. R. have been marked by permanent monuments, as represented by the thriving communities of New England. The responsibility for these living monuments is equally shared by the freight and passenger divisions of this efficient system.

The freight service has been of special importance in the building and the survival of the prominent manufacturing towns of our northeastern states. It is the means of furnishing these towns with raw products for the process of changing the natural materials into their marketable form and, eventually, the means of transporting the finished commodities to the inland markets and ocean harbors. In this way are served the interests of both the communities at the products' source, the manufacturing cities, and the markets of our own country. This, of course, is in addition to supplying the demand for food, clothing, and the other essentials of life. Numerous specific examples of this service could be cited in any of the outstanding industries of New England.

In the making of paper, for instance, the timbered regions of the Northeast furnish great quantities of wood pulp, whose conveyance to the paper mills is provided by the Boston & Maine. When the paper is converted to its finished state, it is literally "broadcast" over the world upon its delivery by the freight service of the Boston & Maine at the door of the nation's land and sea transportation systems.

The passenger division's portion of responsibility for community success lies chiefly in its modern, well-equipped trains, whose duty it is to maintain well regulated schedules of efficient service. By these transportation facilities, thousands of people are attracted yearly to New England's wonderland for vacationists. Truly, should not these seashore and mountain resorts and communities be appreciative of the Boston & Maine's splendid help in acquainting the world with Nature's finest?

The "Minute Man." Boston & Maine Crack Flyer Rounding Horseshoe Curve, Zoar, Mass.

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Your ditch forming
material spreading
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ice cutting
snow fighting

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Economize!

JORDANS aid proper drainage

Save time! *Save money!*

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

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BALANCED DOOR DUMP CAR
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'RALSTON BUILT'

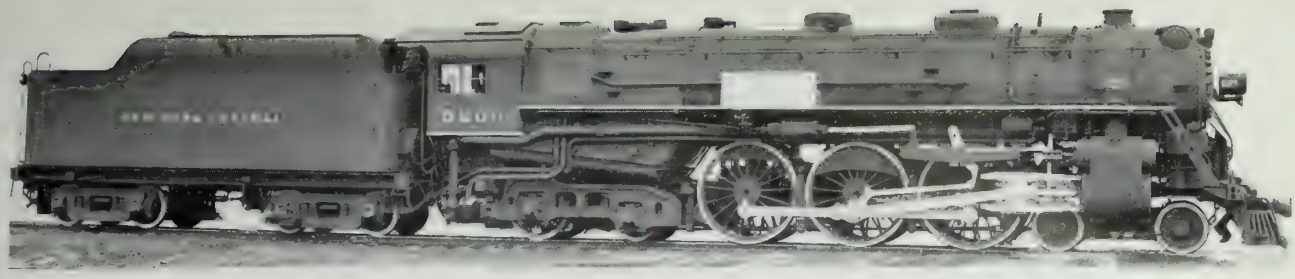
Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
COLUMBUS, OHIO



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GRAHAM-WHITE SANDERS have been applied to insure against loss of tractive effort.

IT IS SAFE to apply Graham-White Sanders under the jacket because they are self-cleaning and are proof against clogging and sand blasting. They sand correctly "rain or shine."

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WHICH DO YOU WANT?

"DRAFT GEAR" or PROTECTION for your cars and lading?

In our 25 years of experience in observing what happens to cars, lading, and to draft gears in service, we have learned to build real PROTECTION into SESSIONS-STANDARD equipment.

Many leading roads have learned the same lessons we have learned and are SESSIONS-STANDARD PROTECTED. They know why. Ask them or us.

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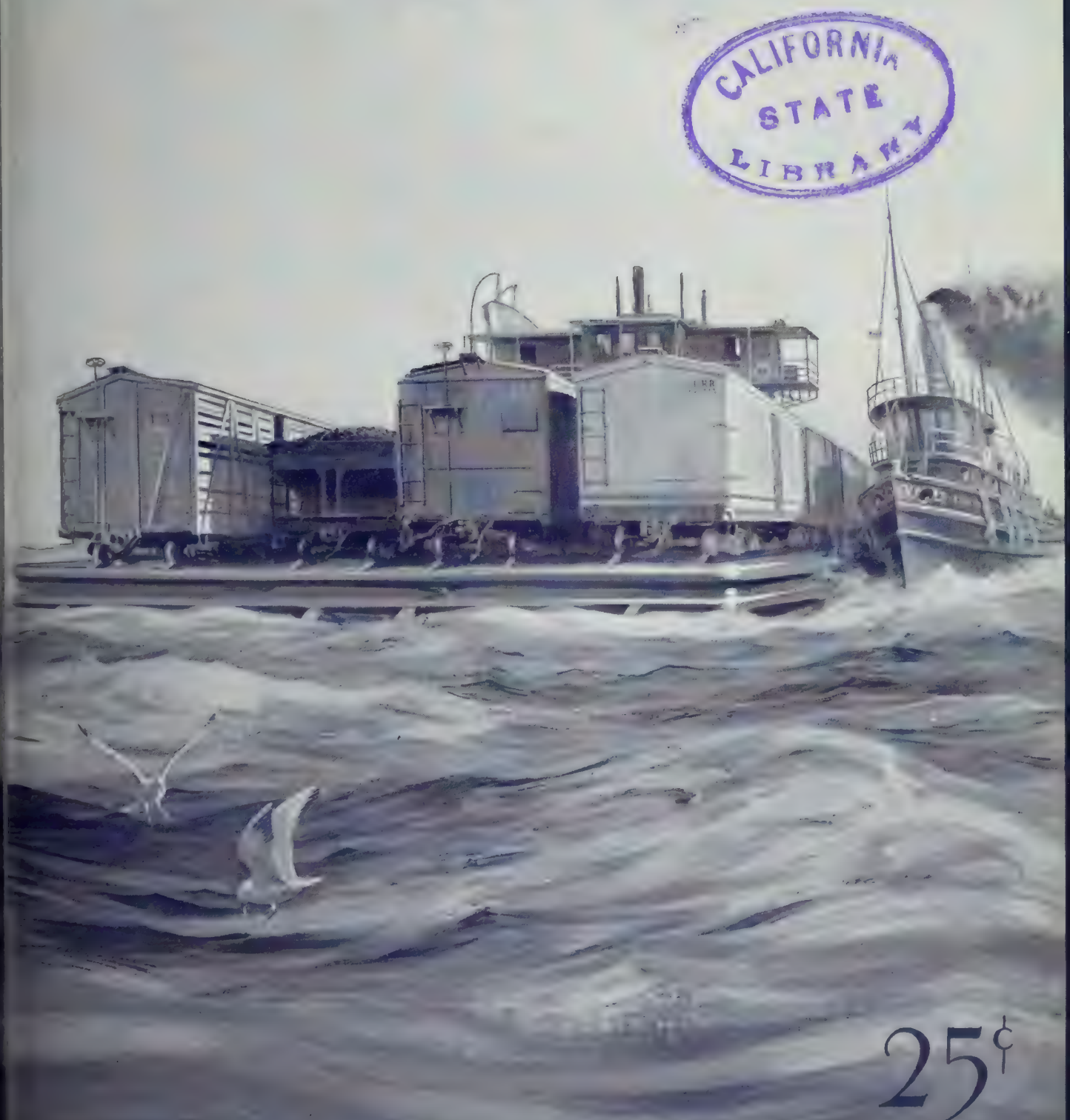

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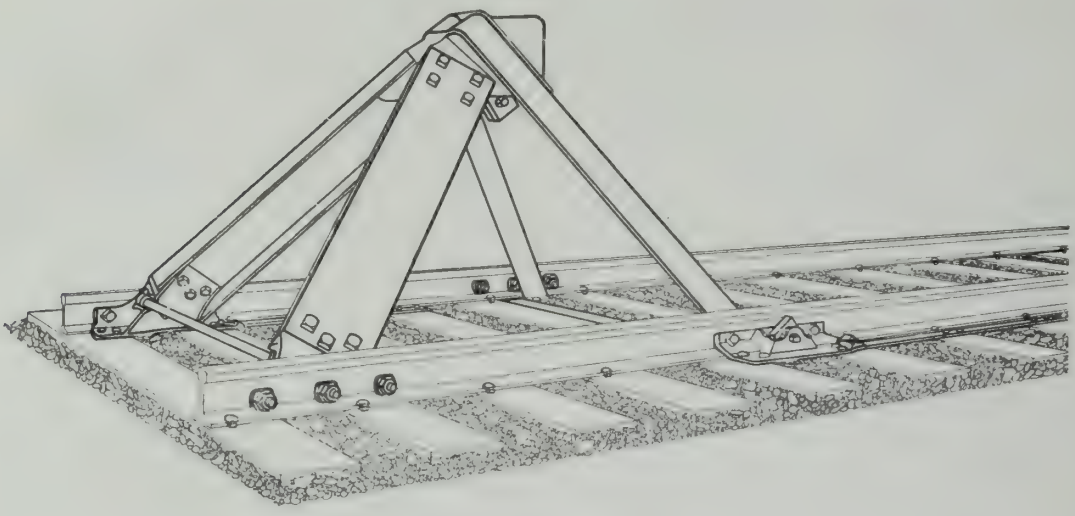
VOL.I NOVEMBER 1927 NO.7

Every detail planned to make installation easy



There is no need to order for various rail sections as the standard Type W post fits any rail from 56 to 130 pounds per yard.

Type W weighs much less than other posts and there is consequently a substantial saving in freight.

The parts are of such form that they are shipped in compact bundles convenient to store and handle. The post may conveniently be shipped in a baggage car when desired.

The head is highest quality coupler steel and weighs less than half as much as in other posts. Fewer men are needed to lift the parts.

The holes in the track rails are for one inch bolts, the same size as the usual track bolt. No special large drill is needed as with other posts.

Only twelve holes need to be drilled in the track rails. Less time is consumed in drilling.

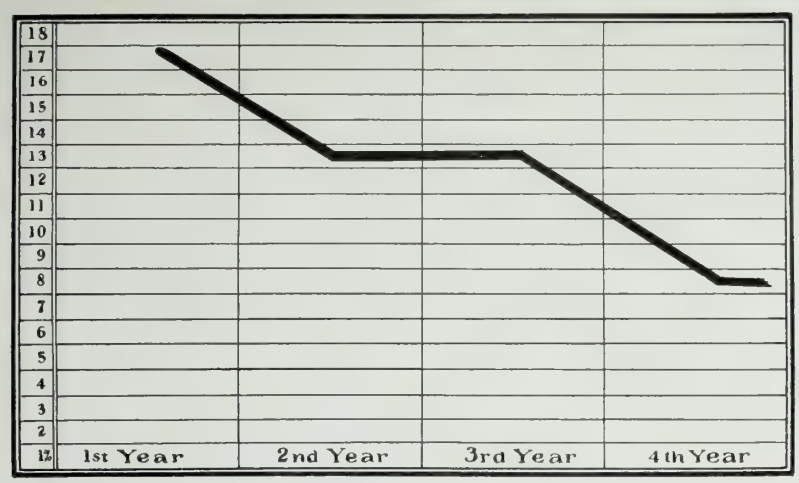
The parts are so designed that they cannot go together wrong. Each post is completely assembled in the factory, insuring perfect fitting of the parts.

There is only one measurement to be made in installing the post; this is the distance (in even inches) from the center bolt of the tension joint to the center bolt of the compression joint.

A tag giving the simple instructions for installing is used. This is separate from the shipping tag. One of these tags is attached, not to each post, but to each of the bundles so that there may be no possible failure to have the information when needed.

We carry a large stock of finished posts and can usually ship the same day your order reaches us.

Hayes Track Appliance Co., Richmond, Indiana



Reducing Truck Lever Connection Purchases From 17.8% to 8.2%

IT is gratifying to watch the decrease in annual purchases when a road adopts Schaefer Truck Lever Connections. (Not so gratifying to us you might think, but it is, because we drop forge Schaefer Truck Lever Connections to insure longer service and fewer renewals).

During the first year that a certain prominent road used Schaefer Drop Forged Truck Lever Connections their purchases totaled 17.8% of their equipment.

In the second year purchases dropped to 13%.

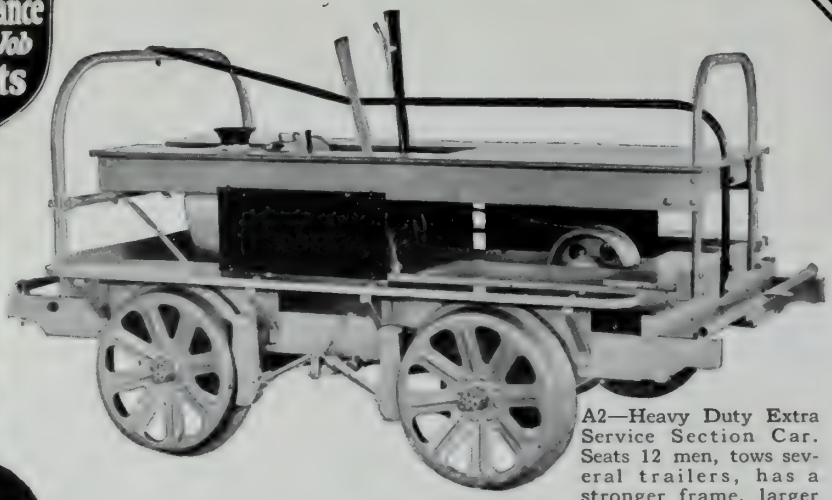
In the third year, it was 13.3%

In the fourth year it was 8.2% and it has been around 8% or less ever since.

Records of truck lever connection purchases by 50 roads over a period of 12 years show that the adoption of Schaefer Drop Forged (weldless) Truck Lever Connections reduces renewals 50% or more.

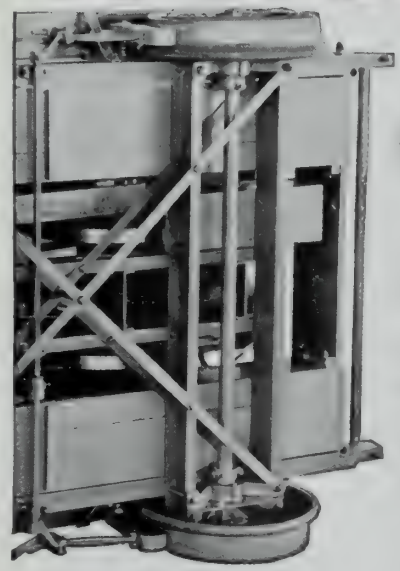
We have some interesting figures on the reduction of truck lever connection costs on a number of prominent roads.

Performance on the Job Counts



A2—Heavy Duty Extra Service Section Car. Seats 12 men, tows several trailers, has a stronger frame, larger bearings and 1¾-inch axles.

Rugged Construction



Tens of thousands of dollars yearly have been saved for Class A railroads by the rugged construction of the thousands of FAIRMONT cars they use.

Note the channel steel cross members, quadruple steel sway brace truss, rigid square design, select white oak axle sills, strongly ribbed castings.

Also note that FAIRMONT frames are easily repaired in the field, due to use of cut thread bolts double-nutted or secured with lock washers or cotter pins — no rivets to work loose and send car to the shop for reaming and hot riveting.

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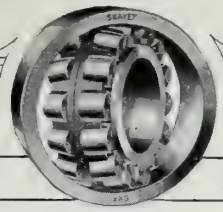
SKF Journal Bearings are basically better than plain bearings



Journal Bearings

SKF *Journal Bearings Are Time-Tested*

A YEAR or two must generally elapse before the value of a roller bearing becomes apparent.

Therefore the choice of a roller bearing with an established record in railroad service becomes of the greatest importance.

In addition to its international record of thousands of journal bearings under railroad equipment SKF bearings have had five years of railroad service under passenger equipment in this country.

For twelve years SKF has been cooperating with leading American mechanical officials in developing a bearing particularly for railroad car journals.

The result is the SKF Journal Bearing—a thoroughly tested product; one that has shown its ability to meet railroad conditions.

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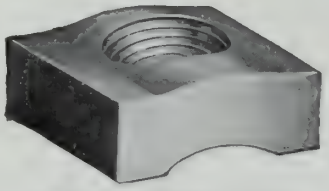
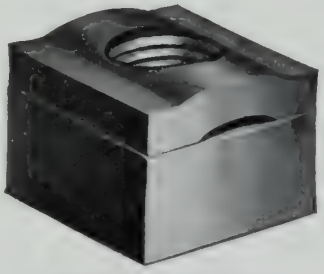
More than 100 Factory Offices Throughout the World

Grip Unit Nut

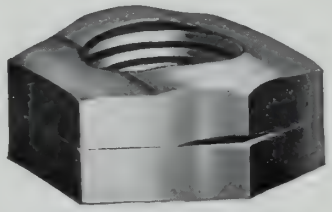
Dollars and Sense



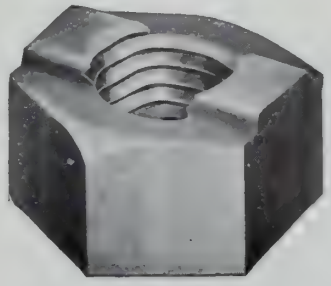
Grip Holding Nut



Grip Lock Nut



Grip Loco Nut



Grip Unit Nut

PRICE is a matter of dollars; but cost—ultimate cost—depends upon judicious selection.

You who keep the railroads' equipment in service expect a nut that fulfills a specific function—keeping bolted parts exactly in place.

Modern transportation demands a nut that functions under the most exacting service conditions; a nut that stays where it's put, hanging on grimly, despite even the hammer-like blows an unyielding winter roadbed delivers—until it is removed *intentionally* by the mechanic's wrench.

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Transportation

The Monthly Magazine of the Transportation Industries

NOVEMBER, 1927

VOLUME ONE NUMBER SEVEN

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P-238

Speed Up Your Shop Work With Red GIANTS

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Depend upon that Name

American Pep in the Far East

The South Manchurian Ry.

By Uthai V. Wilcox

SHOULD Kipling make a trip through Southern Manchuria today undoubtedly he would wish to change that famous couplet of his:

East is East and West is West,
And never the Twain shall meet.

No more striking contrast in all the world is possible showing the mingling of the West and the East than is afforded in South Manchuria. It may be doubted whether some of the learned and sober statesmen who spend perplexing hours over the diplomatic tangles of Pacific countries, have more than the faintest conception of this penetration of western civilization in the century-old land of the Manchus. Here is a paragraph from a letter telling of a ride by rail from Mukden, the capital of Manchuria, where are situated the ancient and royal palaces of the Manchus, down to the bustling young city of Dairen, now the commercial capital of Manchuria:

We left for Mukden in the evening about 8 o'clock on a railroad that was for all the world like many of the fast lines of America. A solid train of Pullman sleeping cars, compartment cars, diner and smoking car, drawn by a big Mogul type passenger locomotive over a broad gauge roadbed as firm and well made as the most particular section boss could demand. Heavy rails, 90 pounds, I think they told me, laid on the standard broad gauge, made a decided contrast to those over which we had of late been traveling, and the train got under way with as little effort as any we had ever used. Soon the rails were clicking away under us as we sped along at a 35-mile clip across the open country that surrounds the ancient capital of the Manchus.

The story of this railway is interesting. Here is found this same transportation system, so thoroughly American in style, in appointments, in equipment, in manner of operation, in almost everything save ownership. In fact, were it not for the officials you might close your eyes and imagine this railroad was over in the eastern part of the United States. And just as an added proof that this article is not leading you astray when you read more about this modern railway in an ancient land if the photographs are not convincing enough, read the following sentence from a bulletin issued by the Guaranty Trust Company of New York. On Page 18 along with much statistical matter of trade, export, sub-

Where the Land and the Sea Meet in Faraway Manchuria Giving Service Which Travelers Declare To Be Equal To Anything Known in America.

A Few Hundred Train Loads of Soy Beans Waiting Shipment to Dairen. We Feed These Beans to Hogs and Such Animals Over Here or Use Them to Enrich the Soil. Paris Has Been Eating Them for Twenty Years As a Delicacy Equal to Our Famous Navy Bean If You Can Think This Way About Any Beans.

passes and customs, this company says:

The South Manchurian Express is the finest train in the Far East, connecting with the Trans-Siberian Railway at Harbin. The appointments of this train are not excelled anywhere. The sleepers are all in compartments, each accommodating two persons. There is hot and cold water in each compartment.

The South Manchuria Railway is becoming known among a certain class of travelers able to hunt out some new corner of the world every season. Following the policy of the Canadian Pacific Railway this road has established a series of fine hotels to go along with the new born railway, and these are in every way fit to be compared with the hotels of America.

Taking this modern railway at Mukden you ride in the standard Pullman attended by a uniformed porter. You awaken in the morning feeling, probably, very much as you would were you riding one of the advertised limited trains in the eastern states. You look out of your window and find you are approaching a city. The smell of salt is in the air. You are near Dairen, the wonderful, all year ice-free port of Manchuria! A thoroughly modern station, a subway for passengers' exit under the tracks, a carriage and motor stand! If you have availed yourself of all the conveniences a uniformed porter will meet you, for he has been advised by wire to make you comfortable in the new place.

You go to the Yamato hotel which will prove another surprise to your rapidly crumbling belief in a backward Manchuria. This hotel is operated by the railroad. The company discovered it is good business to provide such facilities of travel as would appeal to the passenger of discrimination and cause him really to be interested in the city. The hotel is at least ten years ahead of the city. It is appreciated only by Americans and Europeans, but its erection and expert management are but further evidences of the adaptability of the Japanese. A traveler says:

Nor was our surprise lessened when we came to the Yamato hotel, and entered a lobby that transported us the moment we entered to San Francisco or New York or any place but Manchuria. Here was a long, cool lobby, furnished in the best foreign style, with elevator, bell boys and desk arrangements, the same as we had been accustomed to at home.

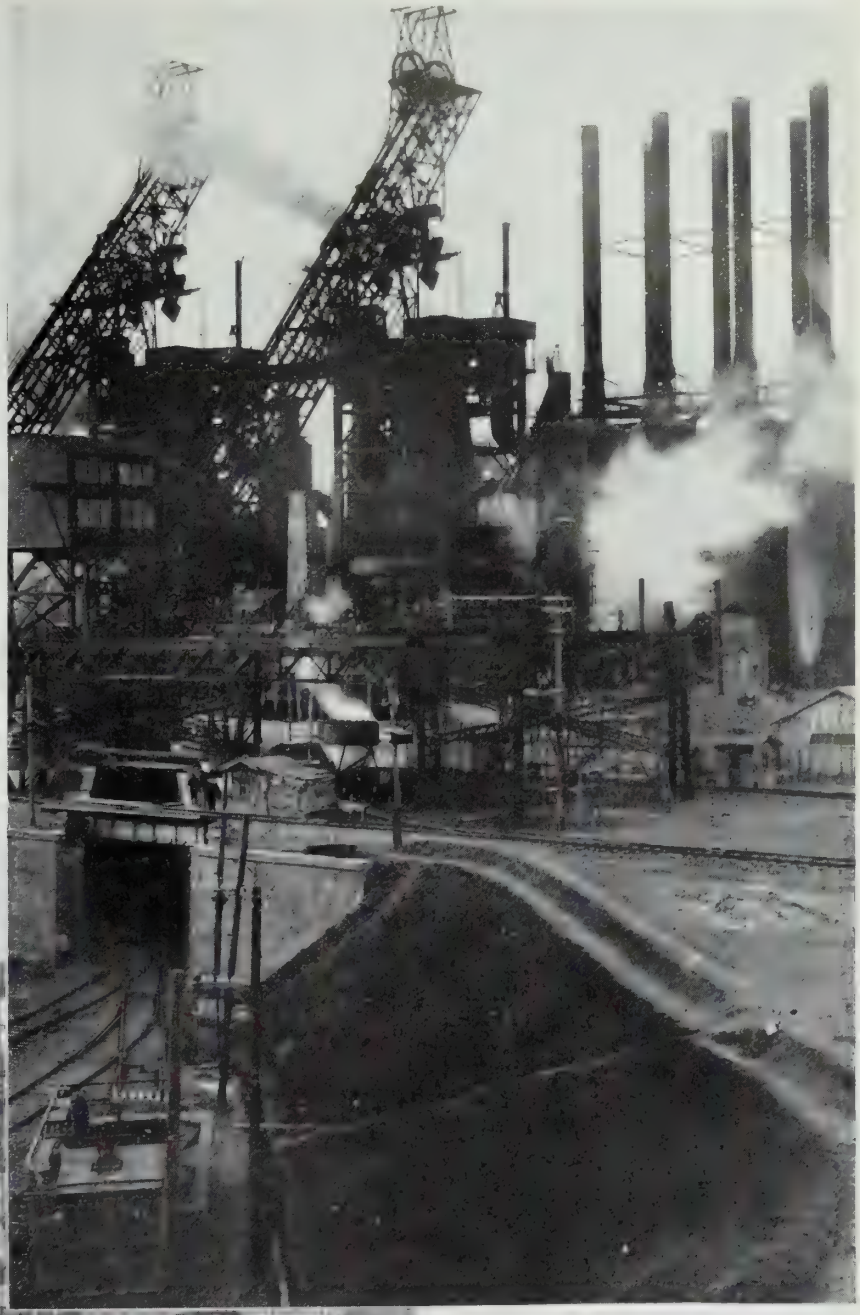
When we went to our rooms we found there were some things about this hotel that we did not have at home in our American hotels. For instance, the wide porches that opened off the sleeping rooms were delightful lounging places such as can be found in none of our hotels. The bath rooms were as large as a small sized bedchamber in many places. Our apartments were nicely fur-

nished with heavy brass beds, dressing tables, thick rugs and full-length mirrors.

A Japanese orchestra played English grand opera. There was a ball room with a stage, and a roof garden, the pioneer of its kind in Asia! This roof garden is like a real Japanese garden with old rocks and shrubbery, goldfish and a waterfall.

Dairen is the terminus of this modern railway of the East. It exercises large influence there, and can be said to control the city even as the early transcontinental railways of America controlled the cities and towns along their rights of way.

In the early days the Chinese had a name for the place which meant "Black Mud Hollow." Then the British and the French made it a base of operation when attacking Peking. Later, it was leased to Russia, and the old Chinese Eastern Railway, which was



Above: The Anshan Steel Works, Future Source for This Material in the Far East. At Left: Coal Mines Operated by the South Manchurian Railway.

not Chinese but Russian, controlled the place.

The city was yet to come, however. The story goes that Count Witte of the old Russian Empire saw the wonderful possibilities of the spot, and rehearsed the matter in such a vivid manner before the Czar that he had the monarch fascinated. True to imperial traditions, the White Father called his ministers together, and placing his finger upon the map at this point,

said, "Build here a city that will be the finest of its kind in all Asia; a fitting reminder of our land. And let the name be Dalny,—the 'Far Away'—an outpost of our empire."

With such authority behind him Count Witte began work on a scale that rivalled the dreams of ancient conquerors. It was such a location that the Japanese took over when peace came after the Russian-Japanese war. They were quick to realize its possibilities. Quicker than the Russians had been. They abandoned Port Arthur and concentrated on Dairen. They changed the name to the one now used which means, literally, "Great Connection."

When the strife of war had passed and the leases of the Russian government had passed into the hands of its conqueror, the South Manchurian Railway was found to be supreme. It was backed by government funds, officered by government men, and made the commercial agent of the Japanese Imperial government in that section of the Orient. It is still that.

Manchuria be it known, comprises the three provinces of Fengtein, Kirin and Heilungchiang. It has an area of 383,000 square miles and a population of approximately 19,000,000. Its frontiers touch Siberia and Korea; the southern part of the peninsula is washed by the waters of the Yellow Sea and the Gulf of Pechili. It lies in about the same parallels of latitude as the northern half of the United States. Manchuria now has better railway transportation than any other part of China because of the energy shown by the Japanese in pushing its development and realizing its great wealth in agriculture and in minerals.

Mukden, the capital, is of special interest because of its ancient history and still gorgeous oriental palaces of the Manchu emperors. Step out of the old West Gate of the city and, apparently, you are in another world, for the modern part of the city is under the immediate control of the South Manchuria Railway. Noting its manner of operation, its efficiency, its far-sighted policy and its excellent construction and maintenance, one is struck by the similarity between its history thus far and that of the Hudson Bay Company of Canada and the old East India Company. It embodies the methods of these ancient empire-making companies but uses the tools of the Twentieth Century.

The South Manchuria Railway Company operates steel works, colliers, water works, electric plants, gas works, building projects, laboratories, and experiment stations. And according to one of its official bulletins, city building and administration are also part of the railway's work. It goes still farther than that. It conducts schools, hospitals, hotels, banks, bureaus, until there seems to be no end to its undertakings. But the railway is interested in more than mere transportation.

First, there is the famous Fushun colliery. This great coal mine, or rather a series of mines, is but 22 miles southeast of Mukden. These mines are remarkable for the thickness of their seams, estimated at 150 feet with a width of 400 feet. The daily output at present is more than 10,000 tons with a conservatively estimated potential output of 1,200,000,000.

An asset that is becoming of greater value constantly and is one evidence of the far-sighted policy of the railway are the research laboratories. These laboratories work along western lines with better methods of dyeing and weaving, silk filature, ceramic art, methods for manufacturing salt, glass, pulp for paper from Kaoliang stalks, the analyses of coal and iron ores and experiments in the possibilities of the Soy bean, and many other things.

The chief experiment station is at Kung-Chu-Ling where agricultural work is emphasized. The ancient method of cultivation of the Chinese farmer is receiving a rude shock. The modernized brown man is making two ears of corn grow where but one grew before, and better ears, too.

Then there are the great Anshan Steel Works. American engineers estimate these works may soon rival all east of Suez. The Japanese themselves say the future source of steel in the Far East is at Anshan.

The railway acts as the godfather to these industries and to the extensive mines of iron ore. There are said to be several million tons of ore in the vicinity of Anshan. Right now there are two blast furnaces in operation. It is hoped ultimately, so the officials say, that an annual production of one million tons will be reached.

Taking a leaf from labor difficulties of western countries the railway has connected with the steel plants an ideal settlement or city. It has provided for its employes' health, comfort, hygiene, education and recreation.

In connection with the steel plant there are 24 miles of railway and 2.5 miles of electric lines, another evidence of the Japanese' adaptability. There are many electric power plants in Manchuria that are operated by the railway. The one at the Fushun Colliers has a capacity of 16,500 kilowatts, with additional equipment to be ordered.

The school work of the railway shows as perhaps nothing else does the far sighted policy of the government. While the British in India have specialized on higher grades of learning and the teaching of the classical, while the great mass of the population received no education and has become the prey of agitators who try to turn the people against the government that educated them; Japan has, through the South Manchuria Railway, remembered the children and wisely begun there. They have remembered also the higher branches as the numerous medical

You've Heard of Mukden Where the Japanese and the Russians Had Such a Row About Twenty-two Years Ago? This Is the South Manchurian Railway Station At That Interesting City. Photo by Burton Holmes.

colleges and the advanced technical schools show. The railway has granted free passage to children who attend school from intermediate railway towns.

All this is a part of the work of this ultra-modern railway. It is indeed an operating medium with power that stops just short of life and death over the inhabitants of the country. Yet, it seems to be seeking honestly to build up the resources of the country and develop them as well as the inhabitants.

Immediately after taking over the old properties of the Chinese Eastern Railway it was decided to make the road gauge standard with that of America. The speed with which the improvements were made is still one of the wonders of the Far East. With the territory it served in a state of chaos, with its physical properties in a deplorable, run-down condition, the road was, without a single day's interruption to traffic, broadened to the standard gauge of four feet, eight and one-half inches. In a year a complete equipment of rolling-stock was installed.

This was all begun in 1906. By 1909 the main line was double tracked with heavy rails and tri-weekly express service connecting with the trans-Siberian line had been established.

Training For Employes' Children

By C. L. Holland

Who was the old fashioned fellow who said that railroad presidents were hard boiled guys, and that railroading was a cold blooded proposition? If you happen to meet him again you'll know what to say, because here's one of the many exceptions to the rule. The particular executive involved in this case is Charles A. Wickersham, president and general manager of the Atlanta & West Point R. R., the Western Railway of Alabama and the Georgia Railroad, with headquarters in Atlanta.

Mr. Wickersham is offering free training to children of employes of these lines who have displayed some form of artistic talent. Always interested in children, Mr. Wickersham has evolved a plan whereby natural talent in the children of any of the roads' employes may be uncovered and developed, the necessary training to be arranged by Mr. Wickersham.

His plan is for the parents of the children to give him the names of the children who have evidenced some talent for singing, dancing, or playing, and to have these children taken to Atlanta at some future time for a tryout. Competent judges have been selected who will choose ten from among the number, and these will have a course in training for a limited time, so that after such training the parents may be able to determine whether it is worth while to continue the development.

Rock Island 75 Years Old

At ten o'clock in the morning, October 10, 1852, that is 75 years ago, the Rock Island ran its first train between Chicago and Joliet. When this anniversary was celebrated, last month, in Chicago, 96 men were picked from a group of nearly 700 retired employes who were guests of the company at a luncheon at the Stevens hotel.

Most of these 96 men are shown in the accompanying illustration grouped in front of the LaSalle street station, Chicago, with President James E. Gorman standing in the center. The information received from the company's Chicago office is to the effect that these 96 men were living at the time the Rock Island lines began operation in 1852. Some of the number served the railroad for more than 50 years before being retired.

It seems fair to say that President Gorman, by long odds the youngest man in the picture, is a very much happier person than the photograph indicates. It seems rather difficult to believe that he, too, has been in the railroad business for 50 years. They must have hired them at a tender age when he began.

Sectionmen Can Get Business

In one of the Kansas City Southern Ry.'s maintenance-of-way meetings, this summer, two men discussed ways in which the company's business might be increased. One is a section foreman, R. M. Murphy of Shreveport. Said Murphy:

"The foreman having industries on his section should be friends of the management of such industries. Visit with them frequently as possible. Ask questions as to whether or not they can be of any assistance by improving their tracks or grounds around their tracks, making a neater appearance and a safer track condition. Ask if they are getting switching service as they need it. If they are satisfied, thank them; and if not, do what you can to make them satisfied. If it is out of your line or your authority to give them what they want, the proper department should be notified at once, and see that they know you are interested in their business. This makes them better friends of yours and the K. C. S."

The second man is division engineer, W. G. Morgan. Said he: "The company has the right to expect from each of us that we will at least do everything in our power to increase the business of the company in order that it may be financially equipped to carry on its business, and to give us the material and supplies we need to maintain the railroad in safe operating condition. When our earnings fall off our maintenances are decreased, and we have less money to work with.

"You men come in contact with merchants and other business men at your stations, and you can keep before them the fact that we are equipped to give them first-class service in handling their business, and would like to have it. You men buy your groceries, clothing, and other supplies from the merchants in your towns, and you have a right to expect of them that they give your railroad its share of their patronage."

The Gentleman Just Behind the X is President James E. Gorman of the Rock Island Lines. In the Throng Surrounding Him Are 96 Men Who Were Living When the Road Started Business 75 Years Ago.

Where the Commission Regulates

How An Idea Grew

By W. A. Hampton

F YOU wish to know, rather briefly, just how railroad regulation, through the Interstate Commerce Commission, has grown upon the country in 40 years, and how much it has cost the people in that time, give heed to these paragraphs:

When the commission was appointed June 30, 1887, it had 11 employes.

In August, 1927, it had 1976 employes.

In 1887 the commission occupied three small offices in Washington.

In 1927 it fills the great building shown in the illustration herewith, 11 floors and a basement, and has overflowed into the Hurley-Wright building across the street, where it fills several more floors, and still is badly cramped for room. The commission and its circumlocution departments now cover 263,261 square feet of office space.

In the first year of its existence, the commission spent a little less than $15,000.

For the fiscal year of 1926, it needed and received an appropriation of $6,000,000.

In 40 years the commission has spent in one way or another, nearly $78,000,000.

In 1887 there were five members on the commission. In 1927 there are 11 members. Of these 11, six are lawyers, only two are former railroad men; one was, before his appointment, professor of political economy in the University of Wisconsin, and one was a newspaper man. One member, Mr. Lewis of Indiana, has no professional rating; he was chairman of the Indiana public service commission when appointed to his present place.

This Picture Shows Eleven Floors and A Basement Full of Railroad Regulation and Things, But There Are Several More Floors of It Across the Street in the Hurley-Wright Building, in the City of Washington, on the Banks of the Well-Known Potomac Where All Used to Be So Quiet, Long Years Ago.

In 1887 there was just one bureau in the Interstate Commerce Commission. Now there are 14 bureaus, ten committees, six divisions, two sections, and two boards.

In 40 years, the states have been represented by membership on the commission in this way: Illinois 4; New York 5; Vermont 3; Iowa 3; Georgia, Missouri, Kentucky, Colorado, Oregon, Virginia, Washington, Indiana, Pennsylvania, Oklahoma and Michigan, 1 each; California, Wisconsin, Alabama, Massachusetts and New Jersey, 2 each.

The first five members of the commission were: Thomas M. Cooley of Michigan; William R. Morrison of Illinois; Augustus Schoonmaker of New York; Aldace F. Walker of Vermont, and Walter L. Bragg of Alabama. Judge Cooley served until 1891 when he resigned; Mr. Walker of Vermont resigned in 1899; Mr.

Bragg of Alabama died in 1891 and the other two commissioners, Mr. Morrison and Mr. Schoonmaker, severed their connections with the commission when their terms expired.

There have been 36 members on the commission since it came into existence, and of this number 14 have resigned; the others have died or have left office upon the expiration of their respective terms.

The law always has had a preponderance of influence in the membership of the Interstate Commerce Commission. Some excuse for this of course is found in the fact that the members and their assistants in various bureaus or offices must have a knowledge of law in order properly to understand their duties. In the bureau of valuation there are 35 attorneys.

The growth of the Interstate Commerce Commission may be attributed to the fact that congress has added so constantly to its duties through the enactment of hundreds of laws. Obviously, no 11 men on earth could make the faintest impression in their efforts to enforce or to report upon their attempts to enforce all the laws, a large part of them perfectly useless, which the zealous congressmen have passed from time to time.

This is a big country, so big that it would be unfair for the commission to insist upon persons traveling from one end of it to the other in order to present certain matters touching upon transportation and its charges. Therefore, the commission long ago hit upon the happy idea of having examiners to represent it in distant parts of the Union. These examiners in many cases, and perhaps in most cases, are attorneys of experience. Their duties are much the same as those of a referee in bankruptcy, or of any attorney taking depositions.

At present there are 72 of these examiners roaming about over the country for one reason or another.

In the bureau of valuation in addition to the 33 attorneys mentioned a few moments ago, there are 30 examiners.

It Takes Millions to Provide Power for Steam Transportation, But No Railroad May Discontinue A Train, However Unprofitable Without A Commission's Authority, State or Federal.

Here are some of the various departments or offices: bureau of accounts; section of depreciation; bureau of finance; bureau of informal cases; bureau of law; bureau of locomotive inspection; bureau of formal cases; bureau of referees; bureau of administration, divided into eight sections; bureau of safety; bureau of signals and train control devices; bureau of service; bureau of statistics; bureau of traffic; section of tariffs; board of suspension; fourth section board; bureau of valuation; bureau of valuation, attorneys; bureau of valuation, examiners.

The chances are, it should be admitted frankly, that if it had not been for the federal government, the railroads might never have adopted the safety devices they are compelled to use. There is no doubt in the minds of fairly disposed persons that this form of government supervision and inspection has had a great deal to do with cutting down the number of accidents of all kinds. The bureau of safety, bureau of signals and train control devices, the bureau of service, bureau of locomotive inspection—all these are useful and valuable forms of government observation and control.

But the well-known octopus is a slow going creature compared to the almost innumerable tentacles thrown out by this commission over so many forms of transportation that it seems about to be overwhelmed by its own weight. There is no more convincing example in government today than the Interstate Commerce Commission if one wishes to see regulation gone mad.

This is not a slap at the commissioners, or any of their staff. Personally, they have nothing to do with it. This is intended as an account, showing how one law after another and one duty after another has been thrust upon this commission until, in its efforts to obey even a few of the demands of congress, it has become hopelessly swamped. There are certain outstanding items in the organization of the commission about which no one seems to know a very great deal. Various estimates have been made, for instance, by certain rather well informed executives as to the amount of money spent by railroads in clerical expenses made necessary in preparing hundreds of reports daily, weekly, monthly,

Left to Right, Front Row: Clyde B. Aitchison, Balthasar H. Meyer, John J. Esch, Chairman; Henry C. Hall, and Joseph B. Eastman. Back Row, Left to Right: Thomas F. Woodlock, Ezra Brainerd, Ernest I. Lewis, Johnston B. Campbell, Frank McManamy, and Richard V. Taylor.

quarterly and yearly. On some of the very large systems these reports run into the thousands. One leading executive has said that the railroads spend more than $30,000,000 a year making out these reports, few of which have any value. It would take one issue of this magazine of 100 pages to give a list of all the reports demanded by the commission from railroads and other utilities.

The bureau of valuation came into existence as a result of the enactment of Amendment 19, otherwise known as the Valuation Act, imposed upon the country by the late Senator LaFollette of Wisconsin. To the present, the commission has spent about $30,000,000 since 1913 in carrying out the provisions of that law, and the railroads have spent enough in the same work to pass the $100,000,000 mark.

Since 1901, the commission has spent a little more than $5,000,000 in enforcing the laws pertaining to safety appliances, block signals and hours of service, for all of which the public has received pretty good returns. The examination of accounts, brought about by the act of June 26, 1906, has cost nearly $7,000,000 since 1909.

In salaries the commission spent, in 1887, a little more than $10,000. In 1926, salaries cost the country $140,000. Since it was created, the salaries of the commission have cost about $2,700,000. Locomotive inspection has cost $4,000,000, and this is a worth while expenditure.

The bureau of service earns its money. This bureau was organized in April, 1920, to execute duties imposed upon the commission by congress. It seeks to bring about the greatest possible cooperation between shippers and carriers. The scope of its activities was greatly increased by reorganization of 1925. It is now subdivided into three sections, car service, efficiency and economy of operation, and transportation of explosives and other dangerous articles.

All these activities, as the record shows, cost money—wads of it, and the people have to provide it.

But this isn't the end of the expense for the people. They pay an additional share in higher rates. Some one may tell you this isn't true, but don't believe him. Whenever you tax a railroad you tax yourself, and the more the company is taxed the more the people pay.

Preaching Safety is like making love to an old maid or a young widow. You can't overdo it.

In Exterior Appearance Both Cars, Single and Double End, Are Identical.

Chicago & Joliet's New Cars

The Chicago & Joliet Electric Ry. Co. has recently put into service ten new interurban cars for one-man operation. Six of the cars are single end and four are double end type, the double end cars being used for local service between certain points on the interurban line. The outer appearance of both single and double end cars is identical. The single end car has semi-individual seats, toilet room and smokers' compartment.

How Electric Terms Were Coined From Names

Five countries have contributed basic words to the language of electricity, according to the National Electric Light association, which gives the following:

Ohm, the measure of electrical resistance, is named for George Simon Ohm, the German discoverer of Ohm's law.

Volt is named after Alessandro Volta, the Italian who discovered the voltaic pile.

Ampere is named in honor of Andre Marie Ampere the French physicist.

Watt, by which the current consumption of the ordinary electric lamp is measured, is a memorial to James Watt, a Scot.

Kelvin is used in Great Britain as a unit of energy, in honor of Lord Kelvin.

None of these is an American, but without the inventive, industrial and commercial genius of Thomas A. Edison their names would not be so famous today.

There'll Be No Stunts

Four British Air Force flying boats started October 17 from Plymouth, England, on an empire cruise of 25,000 miles which is scheduled to take a year to complete. The flight includes the first aerial coasting of India, a complete circuit of Australia, a hop to Hongkong and then back to Singapore, where the fleet is expected to be stationed permanently.

The planes, all of the seaplane type and equipped with two 450-horsepower Napier lion engines, are under the command of Group Captain Cave-Browne-Cave.

Wherever you find patience, fidelity, honor, kindness, truth, there you will find respectability, however obscure and lowly men may be.—H. W. Beecher.

The Single End Car Has Semi-Individual Seats.

Seat Arrangement in the Double End Car Recently Adopted by the Chicago & Joliet Electric Railway Company.

Signals You See On Your Journey

Developing A Great Industry

By William J. Long

AS YOU ride through the night on a passenger train, on the rear platform perhaps, you note with interest the rise and fall of signals along the way—block signals, the protecting arms and lights that mean safety for you and yours. And perhaps you wonder a bit over the system and the rules needed to keep things moving, especially if you don't chance to be familiar with railroading. The twinkling lights of the switches as the train roars through a yard, red, green and yellow, intrigue your fancy. What do they mean?

To the average person red means danger or an auction, which often is the same thing, and yellow indicates a clear track; but about the green you're not so certain. Furthermore, who got up all this series of signals, anyway, when did it begin and where? What is the story behind this care for the safety of human beings and the millions of dollars worth of property in transit on the country's rails?

You might have learned a lot about such things if you had been an interested visitor at the centennial celebration of the Baltimore & Ohio R.R., last month, for there, in a series of panels, the Union Switch & Signal Co., and the General Railway Signal Co., presented the history in understandable form in an exhibit prepared by and under the supervision of K. E. Kellenberger, A. G. Moore and Henry M. Sperry.

The first fixed railway signal was used in England away back in 1834. It was a rotating, crossbar and lamp used by signal men to warn trains of danger ahead. It has its counterpart today in the rotating crossbar and lamp signal used by policemen to direct street traffic. It is interesting, too, that the signalmen of the early days were known as policemen, no doubt because of their duties as guardians of the road.

Monument Erected at Harriman, N. J. on the Erie Commemorating the Sending of the First Train Order.

The semaphore type was introduced in 1841 and so completely met the requirements of railway signaling that in a short time it came into general use. The early signals of the automatic block system, which was an American invention, were of the disc type, and these were displaced later by the electro-pneumatic, and the electric motor semaphore.

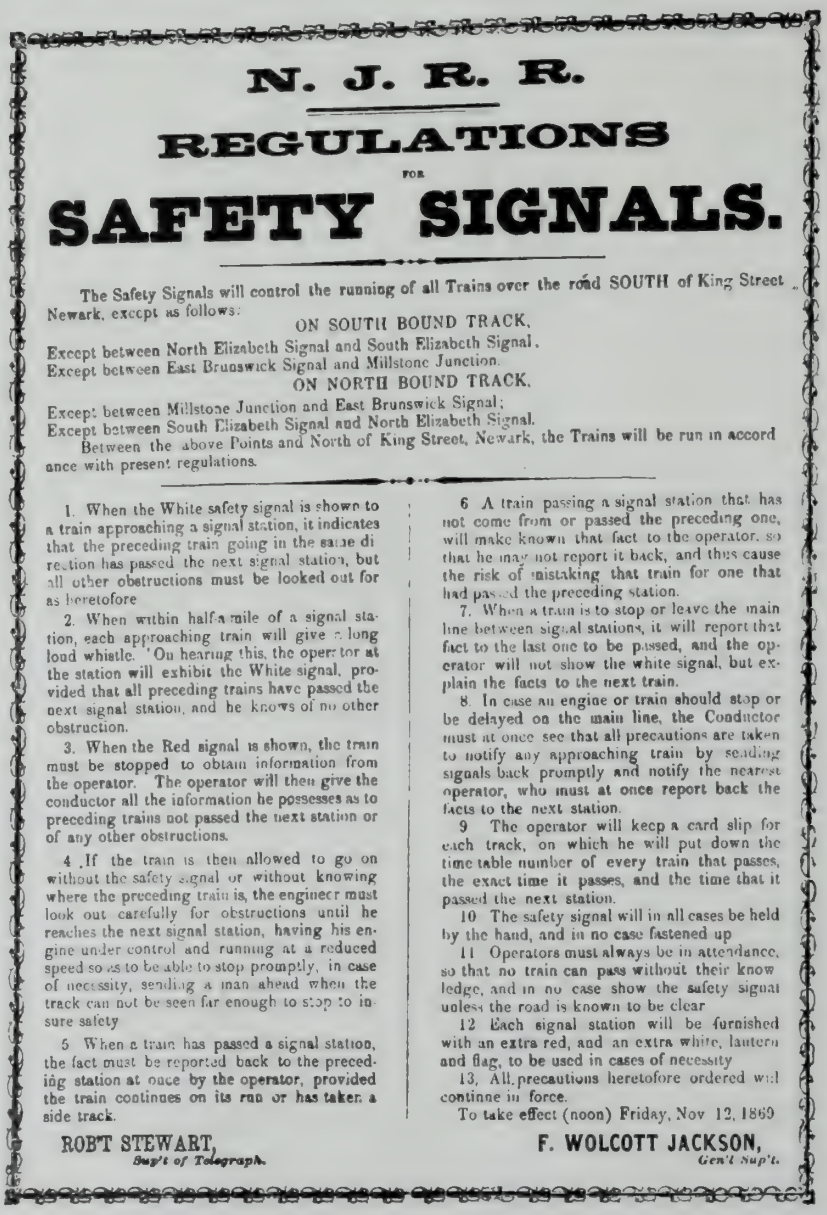
A change in the type of fixed signal followed the general use of electric lighting. First the oil lamp of the semaphore was replaced by the electric light. Next it was found that the colors of electrically illuminated signals could not readily be distinguished in daylight. The color daylight signal then came into use, displaying the same aspects by day as by night, red, yellow and green lights.

Machine at Fostoria, O. for the Centralized Control of Traffic Over a 40-Mile Single Track Line.

A unique type of light signal came into use in 1915, the position light signal. This type was developed to give its indication by position and not by color, thus retaining the distinctive feature of the semaphore signal, which is a position signal with three unmistakable daylight aspects, shown by the horizontal, inclined

or vertical position of the semaphore arm. The position light signal has, however, the marked advantage of displaying the same aspects by day as at night. The next development was the color position light signal. This signal combines the aspects of the color and the position light signals. Two colored lights are used for each aspect, and these lights are shown in horizontal, inclined or vertical rows. This signal was introduced by the Baltimore & Ohio in 1921.

The development of train dispatching was shown in the next panels beginning with the early train dispatching on the New Castle & Frenchtown R.R. which ran from New Castle on the Delaware River to Frenchtown, near Chesapeake Bay, a distance of 17 miles. This was the connecting link for the steamboat line from Philadelphia to New Castle and from Frenchtown to Baltimore. When the railroad's motive power was changed from horses to the locomotives, in 1832, a system of visual signals was put into use for sending information from terminal to terminal as to the movement of the train. This was 12 years before the invention of the electric telegraph in 1844. These visual signals, situated about three miles apart, were ball signals hoisted on poles about 30 feet high. When the train started the flagman at the terminal hoisted a white ball to the top of the pole. The flagman at a second station, observing the position of the signal through a telescope, hoisted the white signal ball at his station to a few feet from the top of the pole. The flagman at the other stations repeated this signal, so that at New Castle it was known the train had started from Frenchtown within a few minutes after it had left there. If the train was delayed, a black ball was hoisted in place of the white ball. This primitive method of signaling the movement of the train by visual signals was an early effort in train dispatching but was limited to dispatching or sending out trains as no means were then available for quickly reaching the crews in charge with instructions for their movements.



N. J. R. R.

REGULATIONS

FOR

SAFETY SIGNALS.

The Safety Signals will control the running of all Trains over the road SOUTH of King Street Newark, except as follows:

ON SOUTH BOUND TRACK.

Except between North Elizabeth Signal and South Elizabeth Signal.
Except between East Brunswick Signal and Millstone Junction.

ON NORTH BOUND TRACK.

Except between Millstone Junction and East Brunswick Signal;
Except between South Elizabeth Signal and North Elizabeth Signal.

Between the above Points and North of King Street, Newark, the Trains will be run in accordance with present regulations.

1. When the White safety signal is shown to a train approaching a signal station, it indicates that the preceding train going in the same direction has passed the next signal station, but all other obstructions must be looked out for as heretofore

2. When within half a mile of a signal station, each approaching train will give a long loud whistle. On hearing this, the operator at the station will exhibit the White signal, provided that all preceding trains have passed the next signal station, and he knows of no other obstruction.

3. When the Red signal is shown, the train must be stopped to obtain information from the operator. The operator will then give the conductor all the information he possesses as to preceding trains not passed the next station or of any other obstructions.

4. If the train is then allowed to go on without the safety signal or without knowing where the preceding train is, the engineer must look out carefully for obstructions until he reaches the next signal station, having his engine under control and running at a reduced speed so as to be able to stop promptly, in case of necessity, sending a man ahead when the track can not be seen far enough to stop to insure safety

5. When a train has passed a signal station, the fact must be reported back to the preceding station at once by the operator, provided the train continues on its run or has taken a side track.

6. A train passing a signal station that has not come from or passed the preceding one, will make known that fact to the operator, so that he may not report it back, and thus cause the risk of mistaking that train for one that had passed the preceding station.

7. When a train is to stop or leave the main line between signal stations, it will report that fact to the last one to be passed, and the operator will not show the white signal, but explain the facts to the next train.

8. In case an engine or train should stop or be delayed on the main line, the Conductor must at once see that all precautions are taken to notify any approaching train by sending signals back promptly and notify the nearest operator, who must at once report back the facts to the next station.

9. The operator will keep a card slip for each track, on which he will put down the time table number of every train that passes, the exact time it passes, and the time that it passed the next station.

10. The safety signal will in all cases be held by the hand, and in no case fastened up

11. Operators must always be in attendance, so that no train can pass without their knowledge, and in no case show the safety signal unless the road is known to be clear

12. Each signal station will be furnished with an extra red, and an extra white, lantern and flag, to be used in cases of necessity

13. All precautions heretofore ordered will continue in force.

To take effect (noon) Friday, Nov 12, 1869

ROB'T STEWART, *Sup't of Telegraph.*

F. WOLCOTT JACKSON, *Gen'l Sup't.*

REGULATIONS CONCERNING BLOCK SIGNALS ISSUED BY GENERAL SUPERINTENDENT NEW JERSEY RAILROAD, NOVEMBER, 1869

The telegraph provided a medium for sending information quickly to delayed trains, for authorizing the movement of extra trains and for dealing with emergencies. Train dispatching plays so important a part in train operation that a monument to commemorate the sending of the first train order was erected in 1911 on the Erie Railroad at Turner, N. Y., (now Harriman) the station from which the first train order was sent.

With the sending of the first train order by electric telegraph in 1851, train dispatching entered the second or present stage of its development.

The manual block system, the first in America, was adopted in 1863-64 on the line between Kensington, Pa., and Trenton, N. J., following a disastrous rear collision at night of eastbound trains carrying soldiers from the seat of war

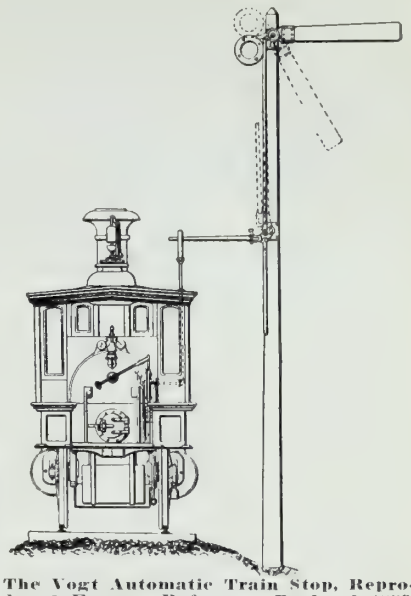
to New York and New England. This system provided for maintaining a space interval between trains. The earliest authentic record of the block regulations that has been found, is dated November 12, 1869. These regulations issued by F. Wolcott Jackson, general superintendent of the New Jersey R.R., gave the rules under which the space interval was to be maintained.

In the beginning the block signal at each station consisted of a box mounted on a post with two red flannel banners, one for each direction. These were dropped in front of a white surface or a white light for the "stop" indication. The banner box signal was superseded by the semaphore signal. One of the early types was a station block signal with the arms for controlling train movements in both directions both mounted on the same post. The block stations were provided with telegraphic apparatus, and an independent wire extended from one block station to the next. The operator at such station was required to make a record of every train that passed, the exact time, and the time that notice was received that the train had passed the next station.

Crossbar and Lamp Signal of 1834 Similar to Some of the Present Street Traffic Signals.

The automatic block system was invented in America and developed on American railroads. Its primary function is to reduce the collision hazard by providing a space interval between trains. The length of this space (the block section) is dependent upon traffic requirements, the most common length being one mile. In this system the signals are controlled automatically by the passage of the train into and through the block section through the medium of the track circuit. The first closed track circuit was installed in 1872. The Interstate Commerce Commission has said "Perhaps no single invention in the history of the development of railway transportation has contributed more toward safety and dispatch in that field than the track circuit." The automatic block system has greatly increased safety but in addition has done a great deal toward speeding up train operation, thus materially reducing the costs of railroad operation.

Smashboard Drawbridge Signal. When Lowered This Smashboard Would Strike the Locomotive Stack if the Engineer Tried to Run Past It.



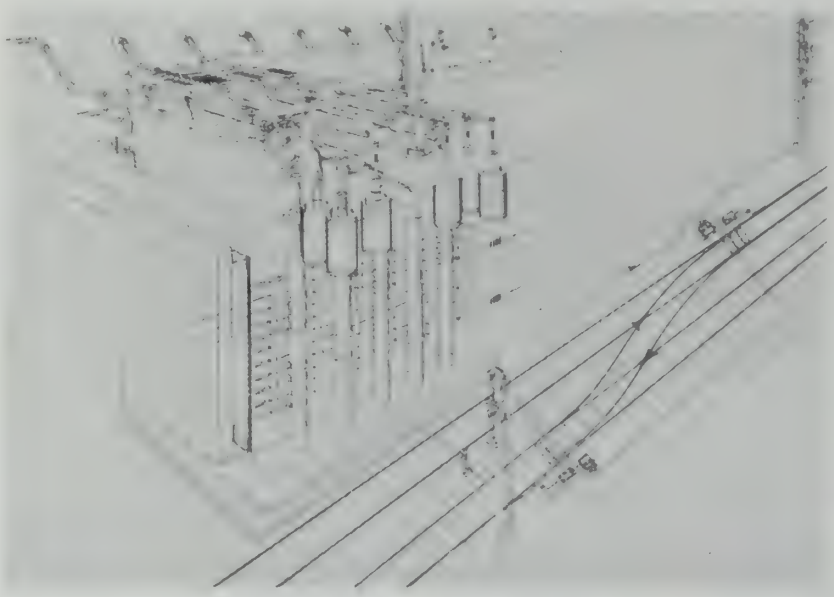
The Vogt Automatic Train Stop, Reproduced From a Reference Book of 1889, Union Switch & Signal Co.

Interlocking is an arrangement of switch and signal appliances so interconnected or interlocked, that their movements must succeed each other in a predetermined order. Its purpose is to provide a safe path for the movement of trains through switches, junctions, railroad grade crossings, through terminal stations and over drawbridges. The first step in its development was made in 1843 at Bricklayer's Arms Junction, England, but the first real interlocking machine was brought into use in England by John Saxby in 1856. This was the forerunner of the well known Saxby & Farmer machine used extensively in England and the United States. The first installation in the United States of an American machine was made in 1874 at Spuyten Duyvil, New York City, and the first fitted with "latch" locking was made in 1875 at East Newark Junction, N. J.

In the Baltimore & Ohio shops, at Chillicothe, Ohio, John D. Taylor constructed the first electric interlocking machine and apparatus

which he installed at East Norwood, Ohio, on the Baltimore & Ohio Southwestern R.R. in 1889. Following this, electric plants were installed at Edgewood, Ill.; New Albany, Ind.; Brussels, Belgium, and Nortonville, Ky. They were so successful that in 1900, a company was organized in Buffalo, N. Y., under the name of the Taylor Signal Co. to manufacture and install this electrical system. This company was merged in 1904 with the Pneumatic Signal Co. of Rochester, New York.

Another development has been the electro - pneumatic plant where all switch units, and in some instances all signal units, are operated by electricity and compressed air. The air valves are operated by electro - magnets, controlled by means of electric circuits from the interlocking machine. Provision is made also for an indication to be received on the machine showing the operator or leverman that the unit operated has assumed a position corresponding to the position of the lever. This is accomplished usually by electro-magnets. Terminal boards to which the electric circuits are connected are a part of the machine as well as circuit controllers for the operation of auxiliary circuits. In this system the operating levers are arranged in a row across the front of the machine and are numbered from left to right. Those turned upward are switch levers and bear odd numbers, while those pointing vertically downward are signal levers and bear even numbers. One switch lever may control one, two and sometimes three switches, derails or movable point frogs. The signal lever thrown to the left serves to clear its corresponding signal or the selected one of a group of signals. To the right it clears another signal or selected one of a group, for train movement in the opposite direction. All signals that may be controlled by a given lever, however, must be those that govern movements over a common section of track.



Isometric Layout of Early Electric-Pneumatic Machine.

Another panel in the exhibit at Baltimore explained remote power switches. The introduction states that remote power switches are isolated or outlying switches operated by power switch machines controlled from train order, block or interlocking stations. The distances from the switches to the stations controlling them vary from a few feet to many miles. They provide economically for the operation of switches which otherwise would require operation by the trainmen of the trains using the switches, the trains stopping for this purpose. By thus eliminating the stopping of trains, the hazard of train operation has been decreased and economic advantages secured.

Train operation by signal indication is a method of directing the movement of trains by the indications of fixed signals without the use of written train orders. For 45 years it has given satisfactory service on a single track line crossing the Louisville bridge at Louisville, Ky. The trains in and out of Louisville over this line totaled 150 a day in 1882. To direct their movements by time tables and train orders was difficult, if not impossible, because standard time had not then come into use. Trains were scheduled on the local time of the four roads and each one had a different time standard. It was this difficulty that brought the space interval method into use. Six manual block sections were established and a special dispatcher at the bridge station controlled the territory by directing the movement of trains through the operators at those six stations. Following the pioneer installation at Louisville, a number of roads began operating certain heavy traffic sections of their single track lines entirely by signal indication. To meet the exacting traffic requirements of the present day, train operation by signal indication offers a highly efficient system of operation for single track lines and for both direction operation on one or more tracks of two, three and four-track railroads.

One of the very interesting panels was devoted to car retarders. As freight traffic increased, the railroads built yards where cars could be classified by flat switching for their different destinations. Hump and gravity yards were used next, so that gravity would do a large

The Top of the Hump, Markham Yard, Chicago; Ill. Cent.

part of the work formerly done by the switch engine. Then came the use of power-operated switches centrally controlled, whereby one operator replaced a number of switch tenders.

Car retarders are power-operated track brakes applied to the tracks of freight classification yards to control the speed of freight cars entering these tracks by gravity. The track brakes reduce the speed of the cars so that they come to a stop without damage to the cars or to their contents.

The first patent for automatic train control was issued to one Pohl in 1859. Ten to 13 years later, the advent of the air brake (1869-1872) gave an impetus to the progress of such devices. Almost all were mechanical in their operation with a lever on the roadside having contact with a trigger on the locomotive which vented the air brake pipe, causing an application of the brakes. As knowledge of the problem increased, a different type was developed, although still requiring physical contact in which a "shoe" on the locomotive made contact with a ramp or short third rail on the roadside. The movement of this shoe operated electrical contacts controlling circuits on the locomotive which in turn controlled the air valves. Later the intermittent type was developed which, using the principle of induction by which electrical influences can be transmitted over a distance without actual conductors, accomplishes the same effect as was secured by the physical contact type. In this type, the passage of a locomotive over a powerful magnet or over a specially designed set of coils in the track, sets up an electrical impulse that compels the apparatus on the locomotive to apply the brakes. With the continuous type of train control, the track rails themselves are subjected to special electric circuits that hold the locomotive apparatus in "clear" position when the track ahead is clear. But the slightest interruption, due to an obstruction on or a break in the track, sets up a train of action in the locomotive apparatus that sets the brakes.

Camden, N. J. Electro-Pneumatic Interlocking Machine.

Flood Cost Railroads Ten Millions

Property damage sustained by railroads in the Mississippi River flood was placed at approximately $10,000,000 in a report by a special committee of the American Railway Engineering Association.

Early Mechanical Interlocking in England.

"The comparatively small loss of human life," it added, "was due in no small part to the prompt rescue work of the railroads."

In the work of rescuing and providing quarters for refugees, the report said, the Illinois Central system alone operated 311 rescue trains, transported 46,381 refugees, supplied 1674 cars for living quarters, moved 892 cars of household goods and 759 cars of live stock, virtually all with out charge, and transported free 1294 cars of food, clothing and supplies with hundreds of carloads of boats, airplanes and other material.

The Missouri Paciffic lines provided transportation practically without charge for refugees, household goods and live stock and provided 1800 box cars for living quartes, 450 of which it obtained from other roads to a total perdium service cost of $13,000. Similar contributions to relief work were made by the Chicago, Rock Island & Pacific, the Frisco System, the Southern Pacific and others.

Queer Happenings in October

TWO interesting things happened, October 14, at Halethorpe, where the Baltimore & Ohio Railroad was celebrating its hundredth anniversary. For one thing, there was a visitor in the grandstand who, not long ago, celebrated his hundredth birthday anniversary. This was Richard Francis, born in July, 1827, five months after the granting of a charter to the B & O, and still a pretty lively old gentleman able to enjoy the big show. Of course Francis had a place of honor in the grand stand befitting the venerable dignity of his years, and witnessed with great interest the pageant depicting the marvelous improvements in means of transportation that have taken place in his life time. Later Mr. Francis was photographed beside C. W. Galloway, vice president of operations and maintenance.

The second feature was the day's attendance, 100,000, making the total attendance up to October 14 in excess of 1,150,000. In addition over 14,000 automobiles found parking space on the fair grounds.

Help For Bill Wrigley

Word comes from London that increased participation in flying by the public is beginning to break down the British prejudice against gum chewing.

Originally taken up by Royal Air Force pilots at the recommendation of the air ministry, the habit of gum chewing while in flight has been copied by passengers on the London-to-Paris air route. The reason for this custom is the discovery that the action of the jaws in gum chewing keeps the air passages between the mouth and the inner ear open and prevents deafness through the closing of these passages by changes in air pressure at different altitudes.

When Should A Man Whistle?

A dog has the same rights as a pedestrian in crossing a highway used by motor vehicles, the Redditch County court at Birmingham, England, ruled October 15, in denying a claim of Ellen Jones, a housemaid, for $150 damages because an automobile in which she and a gentleman friend were riding, upset in an attempt to avoid a dog. She contended that the defendant, Harry Bedford, whistled for his dog at the wrong time.

One More Motorist Strangled

With his neck caught between the shaft of the steering gear and the dashboard of an automobile, Walter McCallen, 49 years old, of Corona, N. Y., was found dead in his car October 10. Dr. Granieri of St. John's Hospital, Long Island City, said McCallen had died of strangulation.

McCallen had visited friends Saturday evening and detectives concluded that for some reason, upon his return home, he climbed into a friend's motor car and fell asleep. While asleep, they believe, he fell forward, his neck was caught and in his efforts to extricate himself he was strangled.

The Q Bars Number 13

Number 13 no longer causes uneasiness in the hearts of superstitious passengers of the Chicago, Burlington & Quincy R. R.

By official action the "hoodoo" numeral has been abolished from C., B. & Q. trains, Traffic Manager A. Cotsworth Jr. announced.

In eliminating "unlucky 13," Mr. Cotsworth said, the road had yielded to the demands of various of its soliciting agents, who continually reported they were losing business from passengers who feared to risk a ride on "No. 13."

Two New Hats, and Death

J. J. Miller of Dunkirk, N. Y., was killed October 4 in the New York subway when he attempted to reach through a subway train window to tug at the new hat of an acquaintance. His sleeve caught, and he was dragged 150 feet before being thrown under the wheels.

John Murphy of St. Johns, Newfoundland, leaped onto the subway tracks to recover his new hat, which had blown from his head. An arriving train cut him down before he could clamber to safety.

Another Dog Decision

A faithful bird dog standing on the track should not be run down by a railroad train if there is any way to avoid a catastrophe, the Georgia court of appeals decided October 12 in the case of R. J. Rundle against the Southern Ry., appealed from the Paulding superior court.

Rundle had sued the railroad for $100, alleging that his dog was attracted to the railroad track by food tossed off a dining car. The engineer contended he blew the locomotive whistle to alarm the dog, but made no effort to stop the train, while Mrs. Rundle, who saw the accident, insisted that the whistle was not blown.

"The less a man wants for himself the bigger is his freedom."

Graham White in a Farman Plane Flying Along Executive Avenue, Between the White House and the War Department, October, 1910. Now look at the Modern Farnum, Blue Bird, Shown on Page 27.

The Struggle for Speed in the Air

War's Influence Apparent

By Major H. H. Arnold

U. S. Army Air Corps

THE most notable of the foreign entries for the air race of 1910 was Claude Graham White. Hoxey and White were the same type in personal appearance, and at Belmont Park seemed to be engaged in a private competition with the title of Beau Brummel at stake. White, like other famous aviators of that day, was not averse to attracting attention. He drove a cream colored closed car, so conspicuous that there never was any doubt as to who was arriving at the flying field. The other aviators, perhaps with a touch of envy, used to call the car the "milk wagon". White had only recently come into world prominence by his splendid flying in the London-Manchester race. But his most spectacular feat was a flight at Washington, D. C., in which he landed a plane in and took off from Executive Avenue, between the State, War and Navy building and the White House.

Wright "Baby", Walter Brookins, Is Giving Something the Once Over With Orville Watching Him Rather Closely. He in the Flying Togs is Ralph Johnstone; 1910.

In nearly every case the planes entered for the Gordon Bennet race were equipped with engines giving from 40 to 50 horsepower more than those used the preceding year. The Wright Brothers, in an endeavor to retain the cup in this country, made their one and only attempt to produce a speed plane. They had put an 80 horsepower engine into a very small plane. During preliminary trials it developed a speed of over 80 miles an hour. It was by far the fastest plane produced during that or the following year. The Curtiss entry was capable of making a speed of slightly over 60 miles an hour. The hopes of retaining the cup in this

country rested upon these two planes.

As in automobile racing, it is not always the machine that makes the fastest time in trials which wins the race. Brookins was selected to fly the Wright racer but unfortunately the engine cut out while he was making a trial flight over the course prior to the race, and the plane crashed on landing. Brookins sustained minor injuries. During the race it became manifest that the planes flown by the other American entries were greatly outclassed, and Graham White won with a speed of about 68 miles an hour. The cup went to England, thus completing the circuit of the only three countries which ever were to hold it.

Before the race of 1911 took place in England aviators, designers and manufacturers concentrated upon producing a plane capable of making 100 miles an hour. However, when the race started it was evident that the speed record would not be raised very much as no radical changes had been made in the planes from those used the preceding year. The best talent of Europe was represented in that race, and America was not supposed to have a look-in, but the unexpected happened. Charles Weymann had gone to France the year before to learn the art of flying. At the time of the race he purchased the latest in airplanes for his own use. He entered the race more as a sporting proposition than with any hopes of winning. With all the cards apparently stacked against him he came through and won with a speed of 73 miles an hour. The American aviation enthusiasts were as much surprised by his victory as were the Europeans.

Earl L. Ovington, Winner of the $10,000 Prize in the Boston Globe's Tri-State Airplane Race in September, 1911. Ovington, of Course, is the Person on Top. He With the Cigaret and the White Pants is Graham White. Mayor Fitzgerald of Boston, Smiling, Doesn't Suspect There's a Camera in the Neighborhood. Mrs. Ovington in the Daring Sport Skirt.

About this time an apathy regarding aviation came over the people in the United States. Very little money was appropriated by congress for army and navy aviation, and the airplane manufacturers had practically no other customers. This condition made airplane development very sluggish. It might well be said there was no marked change in this respect until after we entered the World War. In so far as the Gordon Bennet race of 1912 was concerned, Weymann had won the race of 1911, the race of 1912 was to be held in America, and it was extremely doubtful whether there would be an American entry. It was very easy for the contest committee to decide to hold the race at Clearing, Chicago, but it was decidedly more difficult to get a plane to compete in the event.

Foreign development had been such that there was little doubt that the 100 mile an hour mark would be surpassed. American designers were convinced they could produce a plane with such a speed but it would cost close to $50,000. For a while the money was not in sight but when it was almost too late to bring out a plane in time

—Wide World Photos.

Think of the Flimsy Machine in Which Graham White Fluttered Above the Streets of Washington Only 17 Years Ago, and Then Gaze At This Diagram of the Giant Dornier Superwal Flying Boat for 55 Passengers Now Being Built At the Dornier Works in Germany.

for the race, the necessary funds were raised by subscription.

The selection of a pilot for the American entry was a vexing one. Johnstone and Hoxey had been killed. Brookins had retired from the flying game, and Hamilton's days as a pilot were over. Beachy and Art Smith had not yet reached the crest of the wave. Weymann had given up public exhibitions. There was no foremost pilot in this country. Army and navy pilots were considered, but for one reason or another were passed up. Finally it was decided to call upon an American studying aviation in France, and the opportunity was given Norman Prince to fly the plane but the arrangements could not be completed. Prince later joined the Lafayette Esquadrille, and was killed in combat over the lines during the World War. The pilot for the American entry had not been selected when the foreign planes arrived at Clearing for the race. As a matter of fact he had not had a chance to fly the plane when the race started. Thus the American entry was not taken out of the hangar, although it probably would have given the foreign planes a close race had it been flown.

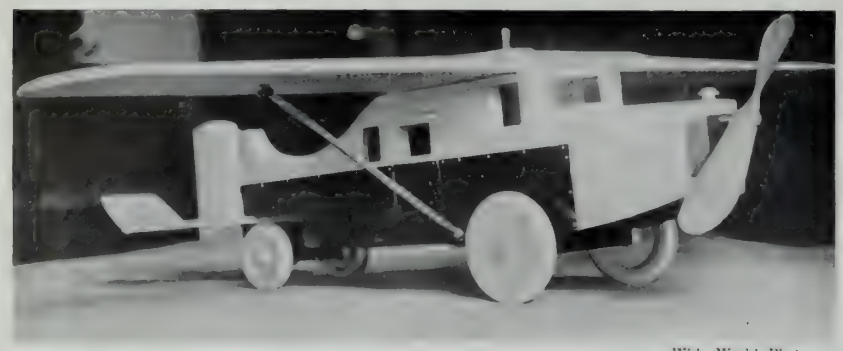
The contest itself marked an epoch in airplane development. It created a new dividing line between fast planes, those having a high speed of over 100 miles an hour and others with speeds under that rate. There were only three participants, two French and one Swiss. The two French planes were the same type, but one had an engine of 160 horsepower while the other had an engine of but 140 horsepower. Jules Vedrines piloted the higher powered plane and Maurice Prevost the other one. Once the race started there was no doubt as to the winner provided his engine could stand the strain. Vedrines made a speed of about 105 miles an hour on the straightaways while the other two planes were just hovering about the 100 mile mark. Vedrines won the race with a speed of 103 miles an hour and was credited in September, 1912, with being the first man in the world to fly at the rate of over 100 miles an hour. Vedrines recognized that his making the record was a remarkable feat, and seemed to accept as part of the accomplishment the greasy finger prints on his clothing and the black lip marks on his cheeks left there by his mechanics when they showed their jubilance in true French style.

—Herbert Photos.

Some Scientific Gents Are About As Skeptical Over This Modern Farman Biplane, Blue Bird, As Others Were in 1910 Over the Funny Looking Thing on Page 25. The One Shown Here Combines the Tractor and Pusher Types of Propeller With Twin Tractor Screws on the Same Shaft, and A Single Screw Pusher.

Although theatrical in everything he did Vedrines was an excellent pilot. He came through the World War unscathed, later landed a plane successfully on the roof of the Magasin Lafayette, only to be killed in a flight of no note whatsoever. However, this seemed to have been the fate of most of the famous airmen. They have gone successfully through almost unbelievable dangers only to perish in apparently safe airdrome flights.

This increased airplane speed made changes imperative in accessories, instruments and landing fields. With a low speed it was not essential that the pilot have such mechanical assistance as tachometers, altimeters, air speed indicators, air pressure gauges, and many other devices now considered a part of the plane. But these devices now became necessary to give the pilot advance notice of any irregularities in the running of his engine which might cause a forced landing. It was not much of a trick to pick a landing field with a plane traveling along at 50 or 60 miles an hour as the pilot had plenty of time to look around. With the increased speed the time between engine failure and actual landing was so short that the decision as to where to land had to be made al-



—Wide World Photo

Model of An Aero-Taxicab Exhibited Recently in Berlin Which It Is Declared Will Carry Passengers One of These Days for Less Than European Third Class Rates.

most instantaneously with the stopping of the engine. Prior to this the older pilots looked with disdain upon all instruments, and considered those who used them mechanical pilots. It seemed to be a general belief that the fewer instruments a pilot had the better pilot he was.

A speed of 100 miles would have been practically an impossibility with the old box kite type of plane in which the pilot sat unprotected between the planes. Hence, all planes after 1912 were of the fuselage type in which the pilot and passenger were protected against the wind blast. To give more comfort celluloid wind shields appeared.

Higher landing speeds came along with the higher flying speeds. The older planes had flying speeds of 40 to 60 miles and landing speeds of 30 to 40 miles. The hundred-mile plane had a landing speed of about 70 miles an hour and needed much greater distances for running along the ground prior to taking off and after landing. This made larger and smoother airdromes necessary. The practice in the United States has been to keep the landing speeds of all planes under 70 miles. It is worthy of note that the field prepared for the French racing plane of 1912 would have been entirely satisfactory for the racing planes of 1926.

One hundred miles an hour had been the ultimate toward which all aviation enthusiasts had been working for several years, and when it was reached there was much discussion as to whether or not additional speed was possible. Such discussions invariably cause designers and manufacturers to slow up on any new types through caution. Consequently the same planes were used in the Gordon Bennet race the following year. Engines with slightly increased power were installed, however. Maurice Prevost won the race in 1913 with a speed of 126 miles an hour.

The World War prohibited any airplane speed races being held from 1914 to 1919 inclusive but the development of faster planes was forced upon all countries engaged in the war. The single seater pursuit planes used in the war were only speed planes with armament attached. Naturally, an army with the fastest fighting planes had an advantage over its opponent. During this period inventors, designers and manufacturers were allowed to run wild in their efforts to produce the fastest planes for use at the front. The speed increased continuously until at the end of the war pursuit planes were making speeds in excess of 130 miles an hour, and a new speed record waited only the first competition.

With very few exceptions every speed record made by airplanes since the World war has been

—Herbert Photo

The Rohrbach-Rocco Ten-Passenger Plane, An Amphibian, All-Metal, Steel and Duraluminum Ship With Two Rolls-Royce Motors, Now on the Regular Flights Between Hamburg and London.

—Wide World Photo.

Savoia Monoplane in Which the Italian Ace, De Pinedo, Completed His Four-Continent Flight From Roosevelt Dam, Arizona, After His First Plane Was Burned.

made by government-owned planes. This is true of records made both in this country and abroad. Before the war France was conceded to have a big lead in aeronautics, and since the war she has made every effort to retain that lead. While this country has not spent the large sums of money needed to maintain a large air force, it has specialized in producing planes of the most modern types in small numbers. Beginning with 1920 the record for maximum speed for airplanes has been kept quite busy jumping from the United States to France and back again.

The Gordon Bennet race passed as an airplane classic in 1920 with the cup in the permanent possession of France. Since that time practically all records for maximum speed for airplanes have been made by planes constructed for our Pulitzer race or by planes especially constructed by the French to break the record. Since 1919 maximum speed over a one-kilometer course was recognized as the mark above all others to be sought. In order to get the maximum speed the pilots drove their planes from fairly high altitudes to get the advantage of the increase of speed given by gravity. They leveled the planes before reaching the starting line and crossed the line in horizontal flight. This dive and sudden pull up subjected the planes to terrific strains, and in some instances caused the collapse of the planes and deaths of the pilots. This danger caused the authorities to change the rules quite recently to provide for a level flight for a sufficient distance before crossing the starting line to eliminate any advantage secured from the dive.

There are other conditions which now enter into speed competition. The French have not placed a limit on the landing speed for their racing planes. While this factor makes greater air speeds possible it also adds materially to the danger. It has been the policy of our government to have all racing planes comply with the Pulitzer Trophy rules, i.e., to have a landing speed of not more than 70 miles an hour. This rule makes safe landings almost a certainty but limits to a certain extent the maximum air speed.

The first Pulitzer race was held in 1920, practically all the contestants being army or navy pilots. The planes used were constructed especially for the race with a view to their ultimate adoption as pursuit planes after necessary changes had been made. Lieut. C. C. Mosely of the army air service, won the race with a speed of 156 miles. This record did not stand very long, however, for before the next race took place, Sadi Lecointe, in an especially constructed racing plane, made a record of 205 miles at Paris in September, 1921. Thus the 200-mile mark was passed within three years after the close of the World War.

The Pulitzer race of 1921 was held at Omaha in November, and while new type army and navy racing planes competed, the best time was made by the navy racer with Bert Acosta at the helm. Acosta's record for the race was 176 miles. Later he tried for Lecointe's record in a straightaway flight, but the best he could do was 197 miles, and the record was safe for another year.

During the following year our government set out to get planes to break all records, and still comply with the Pulitzer race rules. Orders were given to contractors for planes with high speeds of not less than 190 miles, and designers were allowed the utmost latitude in producing them. This resulted in many peculiarly shaped planes awaiting the starter's gun at Detroit in October, 1922. Fifteen planes started in the race and 11 finished. Seven contestants had excelled the record made by the winner of the preceding race. Lieut. R. L. Maughan, army air service, won the race with a speed of 205.8 miles. His speed on a closed course excelled that of Lecointe's, and the record again returned to this country. Accordingly it was not surprising that he should break the record again a few days later with a speed of 216 miles. Even that record was not destined to last long, however, for within four days

Brig. Gen. William Mitchell took the same plane over a one-kilometer course at a speed of 222 miles.

The army decided to use its old planes in the race the following year, and the navy ordered new ones. As in automobile racing, the apprentices of yesterday are the winners today. Lieut. Al. Williams, U. S. navy, who had been working his way upward in the speed classic during the two preceding years, was assigned one of the new planes. Williams' experience in the race at Detroit, his subsequent experiments with high speed planes, with his natural flying ability, made him the favorite at St. Louis in October, 1923. The race was very closely contested with less than two miles an hour between the speeds made by the first and second planes. Williams won at a rate of 243 miles. Later, over the one-kilometer course he raised the record to 266 miles an hour. The 300-mile mark was not far off but as yet unattained.

The United States was willing to rest upon its laurels in 1924, and made no attempts to better Williams' record. However, the French were not satisfied to let the matter rest. Once again they produced a plane for the one purpose of regaining the record. The horsepower used in racing planes had increased gradually until in 1924 our racing planes were using 500 horsepower engines. The French plane had an engine of 550 horsepower. On December 11, 1924, Warrant Office Bonnett broke the record made by Williams, and his mark of 278 miles an hour stands today with no planes in sight capable of excelling that speed. By diving his plane and aided by a tail wind Williams made an unofficial speed of 305 miles, but with Bonnett's record still unbeaten, Williams still hopes to find a plane that will excel the 300-mile mark in normal flight.

Mankind seems never to be satisfied with existing conditions when it is possible to obtain increased personal comforts or a few minutes' time saved by expending a little effort, even if personal risk may be involved by so doing. Airplane racing is recognized as an extremely hazardous task but the risk and hazards will not prevent attacks being made upon the speed records until the ultimate has been reached.

Is it much of a stretch of the imagination to visualize a plane leaving New York and keeping pace with the sun across the continent to San Francisco? Lieut. Maughan made the trip between dawn and dark, 2670 miles, with breakfast in New York and dinner in San Francisco. A 300-mile plane could easily make it between breakfast and luncheon.

This is the second of three articles on the development of aviation, by Major Arnold of the U. S. Army Air Corps. The concluding article describing airplanes as common carriers, will appear in December

An 8 A. M. Report—Some Day

A superintendent's chief clerk is said to be the author of this pleasant contribution to the joy of nations. Anyway the M-K-T magazine presents it with this blind credit:

One of these days our 8 a. m. report will read like this:

Cloudy, high southerly winds, velocity 40 miles an hour, seriously retarded movement northward planes.

Passenger special north, airplane 2001, developed motor trouble at altitude of 19,000 feet over Vici. Engineer, in attempting to replace defective spark plug, slipped off, due to defective hand hold, and when last seen was falling in direction of Woodward. His parachute apparently working O. K.

No. 403, airplane 2002, Pilot Dellis, ran into squall at an altitude of 4,500 feet over Altus. Elevator control cable snapped, causing machine to go into loop, and three revenue, and 28 deadhead passengers fell out. Undertakers now busy picking up remains, using the "blotter" system. Pilot Dellis finally got machine under control and landed safely. Pilot not injured. No other casualties account all passengers lost in loop.

No. 83, airplane 2003, in dropping a piano consigned to Altus, used wrong sized chute and further failed to consider wind velocity, with result piano hit court house instead of station platform, badly damaging piano, and generally shaking up court that was in session.

No. 404, airplane 2004, in dropping off two passengers at Mangum, man and wife, both insisted being dispatched with separate parachutes, wife landed in our water reservoir at Mangum, husband manipulated his chute and went on to Hester. Claim agent on ground.

A Flying Premier

Stanley Bruce, premier of Australia, one of the latest private owners of an airplane, has introduced an innovation in the form of a hangar in the cellar of his house, similar to a garage, for storing his plane. He expects to use his flying bus for hops from Melbourne to Canberea, the new capital, 250 miles away.

Veteran Designer Dies

Charles M. Manly, credited with being the designer of the first gasoline engine used for aviation, and designer of the Langley airplane in the historic experiments of 1903, died October 17, at his home in Kew Gardens, Queens, N. Y.

To increase interest in aviation the Marquis and Marchioness of Townsend recently gave a "flying house party," the guests being carried from London to Raynham Hall, the scene of the event, in several airplanes.

Henry Ford promises to build a plane that will carry 190 passengers. Tom Thompson says, "After seeing nine children climb out of a Ford coupe I don't doubt the announcement."

New Uses for An Old Discovery

The Story of Nickel Steel

By A. E. Hanson

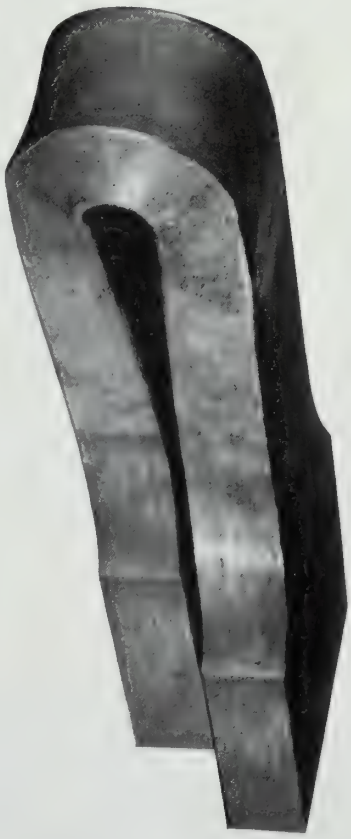
THE first nickel alloy steel was produced by Faraday. While more than a century has passed since the great physicist's historic experiments, the industrial use of nickel steel in the transportation industries is of comparatively recent origin. This is easy to understand. The discovery of nickel steel was eminently an anticipation of a want of a future generation. Little purpose would have been served by using anything but plain carbon steel in, for instance, the earlier locomotives.

A very different situation exists in the transportation field today. Invention and development have progressed so rapidly that the use of the strongest materials known is essential for many services. The recent spectacular flights over the great oceans were made possible only by the reliability of the air cooled engine, a triumph of nickel steel. The success of the modern automobile is based upon the same foundation. Airplanes and automobiles are the methods of transport which loom most largely in the public eye today. The railways, however, are the backbone of the country's transportation system, and alloy steel is no new thing in the railway field. For certain of the more vital parts of locomotives alloy steels have been used for more than a quarter of a century, and their sphere of usefulness is being gradually extended.

The progress made by the railways in the use of alloy steels cannot be compared, however, with that attained in the automotive field. Some years ago this industry made an intensive study of steel, with the result that 42 alloys and 17 variations of heat treatment are now included in automotive specifications.

Although the problem of the railway companies with regard to their selection of materials is practically the same as that of the automotive industry, no comprehensive scheme of a similar nature has yet been undertaken by them. The lack of progress in this connection is attributed generally to the fact that the average railroad shop does not possess the facilities for heat treating special steels.

This condition, of course, will not last. Great progress has been made in railroading during recent years. Present records show better ton mile per train hour performance, more car miles per day, greater fuel economy, and an increased factor of safety. Moreover, more progress is being made in locomotive design, and this development inevitably leads to a consideration of the merits of alloy steels for this purpose.



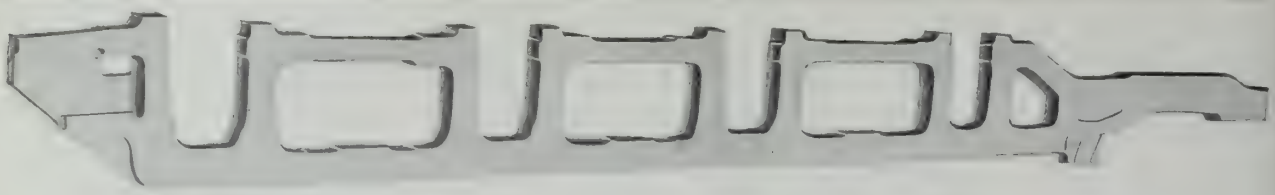
Here's Some Nickel Steel Boiler Plate Bent Back on Itself Without Fracture.

There is a very definite limit to the physical properties which may be obtained from ordinary carbon steel. Increasing the tensile strength above a certain point merely results in lowering the toughness of the steel. It is also very difficult to insure that the physical properties will be uniform in parts of large mass. Hence, for services where ordinary steel fails to afford a sufficient factor of safety, better materials must be employed.

Nickel and chromium probably are the most important alloys used in connection with steel today. Although these elements will alloy with most of the commoner metals, and generally will increase their hardness, toughness and ductility, it is in connection with steel they are most widely used. Chromium, primarily, is the hardening agent. Nickel is used largely to insure toughness and ductility with adequate tensile strength. It is these qualities which are essential for many locomotive parts, notably the frames.

These frames are the most important and largest castings entering into its assembly. A failure of a main frame is one of the most serious types of defects with which the mechanical department can be called upon to deal. Moreover, during recent years, this particular type of failure has been by no means uncommon.

The Canadian Pacific Railway, as a result of these conditions, has adopted for its frames a low carbon nickel steel, a characteristic of which is its ability to resist fatigue



Low Carbon Nickel Steel Locomotive Frame Casting After Machining.

and shock, while still maintaining adequate strength. The necessity of developing a steel of maximum toughness will be appreciated by those familiar with the severity of Canadian conditions. This railway also uses nickel steel boiler plate in its Pacific and Mikado type locomotives. The use of nickel steel in this instance has enabled the boiler pressure to be increased 25 per cent, while keeping within a total locomotive weight increase of two per cent. These new locomotives will haul 16 cars 10 miles an hour faster than the older locomotives could haul 15 cars on the same fuel consumption.

The nickel steel used is remarkably tough and ductile, and generally speaking, in the transverse bend tests, the heaviest plate can be bent flat on itself without fracture. Specification requirements called for the bending of the plate around a pin, the diameter of which is equal to a certain percentage of plate thickness, this being worked on a sliding scale based on the usual practice for carbon steel. As nickel steel stood this test readily, the tests usually were carried further until the plate would bend flat on itself. The ability to withstand such a test illustrates the extreme ductility of nickel steel.

The use of nickel alloy steels by the larger roads has enabled them to increase hauling power, lengthen equipment life, reduce weight and provide an increased factor of safety. Axles, piston rods, fire box plates, staybolts, forgings, tires, main and side rods, boiler tubes, engine and stay bolts, grate bars and roller bearings are some of the many parts for which nickel steel has been adopted.

The future trend of railway development is in the direction of longer and speedier hauls with heavier loads. The present aim of transport engineers is to improve the equipment of their roads without appreciably increasing the weight of their rolling stock. This it is declared they may achieve by the suitable use of nickel steel.

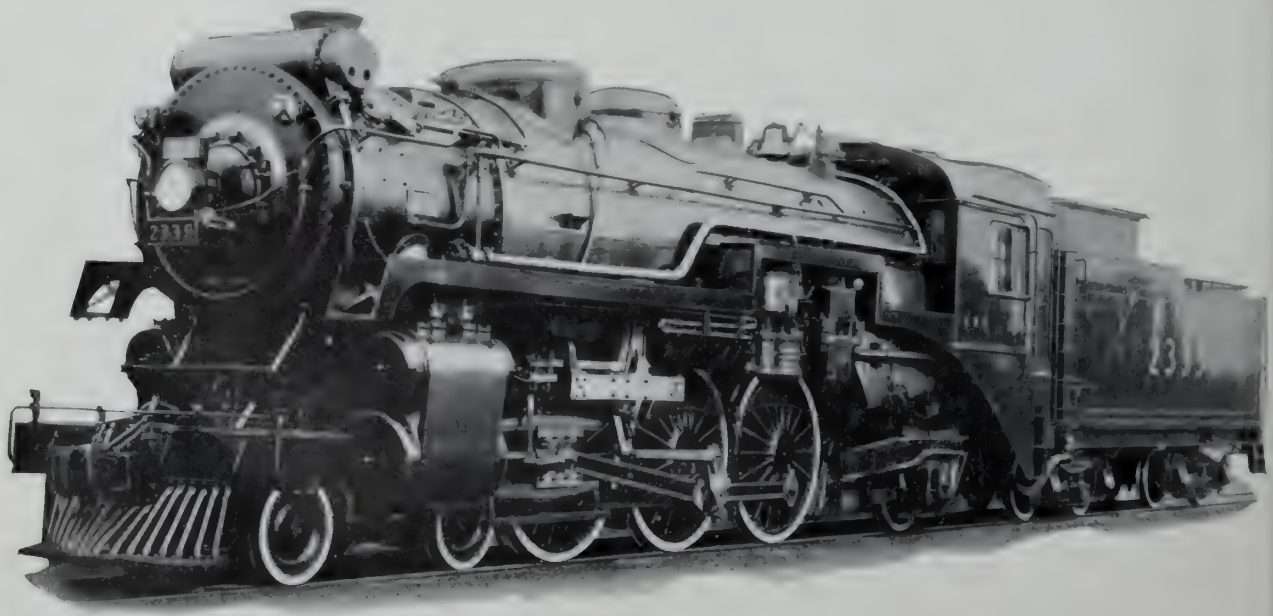
Plane Hops With Nitro

Joe Glass, commercial flyer, hopped off from the Matamoros, Mex., airport one day, a week ago, on his thirteenth flight to the Tampico oil fields with several quarts of nitroglycerine.

"There's nothing to be scared of," Joe said when he was reminded that he was carrying enough nitro this trip to blow up a good-sized town. But the next moment he admitted that should he make a forced landing, the explosive, plane and pilot would be a total loss.

So far as is known, Glass is the first aviator to transport nitro through the clouds.

A little discontent is necessary to keep some men going ahead.



New Canadian Pacific Railway Locomotive, Pacific Type, in Which Nickel Steel is Used for Frames, Main and Side Rods, and Boiler Plate Shell.

What Does It Cost You to Operate?

The Accountant Explains

By M. Zass

Milwaukee Elect. Ry. & Light Co.

IT IS necessary, for a number of reasons, to know what it is costing us to operate and maintain a certain piece of equipment, or a group of certain similar kind of equipments, and our special account must produce this information. In order that this may be accomplished, it will be necessary further to subdivide our special account so that a cost will be found for each vehicle, or each group of vehicles of similar make and capacity. With a small fleet of cars it can readily be arranged to show the cost of each individual piece of equipment, and, where this is done, the results should prove, over a period of time, a good index as to whether or not such a vehicle is economical to continue in service, or whether it should be scrapped or traded in for new equipment. This will work out all right with a small group of cars, not exceeding 25 or 30. Where the number of cars is greater, this method becomes somewhat cumbersome because of the large number of sub-accounts and the resultant amount of clerical work necessary to the detail posting.

—P & A Photo.

This German Motor Bus is 34 Feet Long, Has Six Wheels, Seats 81 Passengers, and That's All the Conductor Admits.

In a large fleet there will usually be found a number of similar make and size of vehicle which may be grouped together, and we can arrange our account to show a cost for a certain group of similar cars or trucks, rather than for each individual car or truck. It is very true that some particular unit in a group, by reason of age or condition of service, may cost more or less to operate than others in the same group, and by keeping a group cost, we lose the advantage, previously pointed out, of being able to determine the operating efficiency of a particular unit. However, where a large fleet is operated, some other means is usually provided by which the operating efficiency and economic life may be determined. From the accounting standpoint, and for the purpose we have in mind, it should be sufficiently accurate to use an average cost of a group of cars or trucks. Such an average cost would be determined either on a mileage basis and expressed as a certain cost per mile operated or it may be determined as a cost per hour or per day operated. Whatever method is used is contingent to some extent on how we intend to make our distribution of costs, and that leads us into the consideration of the second requirement of our special account mentioned at the beginning of our paper, namely, that it must provide a means of properly distributing costs over the various accounts which have received the benefit of the operation of the various pieces of equipment.

There are several methods by which the accumulated costs in our special account may be distributed over the accounts which are properly chargeable and which received the benefit of the operation of the equipment.

Theoretically, our object should be to distribute exactly all costs of operation and maintenance into the various accounts receiving the benefit of the service rendered by the equipment and in exact proportion to the amount of service rendered. This would be ideal, but it would require entirely too much

bookkeeping and clerical work to accomplish. We must, therefore, find a more simple way of doing this and yet have the ultimate results reasonably correct.

One method would be to distribute the costs as an overhead. While this method may be the easiest one to do, it is by far the least accurate or desirable and is not recommended.

Another method would be to distribute the costs on the basis of cost per mile operated. This is a great improvement over the previously mentioned method, but it still has some undesirable features, as, for instance, take two trucks of similar make and capacity. The cost of operation and maintenance would naturally be very nearly the same for each truck, and consequently the rate per mile at which the service of these trucks would be charged out would, likewise, be the same for both trucks. One truck may be assigned to a job on which it would be employed continuously throughout the day but would make but very little mileage, while the other truck would be assigned to a job on which considerable mileage is made. It will be seen, then, that if the use of the trucks were charged out on a mileage basis, the charge for the use of the one truck making the small mileage might be considerably under the actual cost, while the charge for the other truck might be too high.

A more equitable method of distribution will be found in the hourly or daily basis, making a charge of so much per hour or so much per day for the use of the automobile or truck. This is by no means proposed as an absolutely accurate and perfect method, as it can be argued that such costs as repairs, gasoline and oil, and tires are governed entirely by mileage actually made by the vehicle. On the other hand many of the other component costs in our special account are measured on a time basis. Trucks hired on the outside are usually charged for on the hourly or daily basis and, all things considered, I believe you will find the hourly basis as the one most satisfactorily serving the purpose.

The determination of the rate per hour to be charged for the various pieces of equipment is perhaps the most difficult thing in the whole proposition. To obtain a reasonably accurate figure it is necessary to use at least a year's cost figure as a basis where possible. If you have decided to keep your costs by groups of similar equipment, then, of course, the total cost for the whole group should be the basis for determining the cost per hour and such a cost per hour would apply to each vehicle in the group whether it be new or old.

—F. J. Koch Photo.

In the Mountain Regions of Kentucky the Sign Painter Moves His Shop by Motor.

The rates per hour ought to be checked at least every six months to determine whether they are adequate to cover actual costs and to adjust any rates which may be found to be either too high or too low, the idea being, of course, that the charges made for the use of the automobiles and trucks, and which are entered as a credit in the special account, will be sufficient to balance the charges for operation and maintenance. It is impossible, of course, to balance the charges exactly each month for the reason that some months may show rather high maintenance charges due to considerable overhauling work, or other reasons, while other months may be lower, while the charges for the use of the trucks (which would appear as credits in the special account) would be a fairly constant figure, as it should be.

There is but one thing further that the accountant will have to have to complete the mechanism of this special account and that is a monthly report or statement from the operating department which will indicate the number of hours each truck or automobile was used and the particular work or job on which it was used, together with the charge account number for such work, so that the proper completing entries may be made. The form and manner in which this information is gathered will have to be left to you, as conditions and circumstances on your properties will govern the method used.

This is the concluding installment of a paper read to the accounting section, Wisconsin Utilities at Green Bay. The first part appeared on Page 71 in our October issue.

Industry Must Cooperate

The industries of New England are diverting from the railroads of New England to motor trucks approximately four million tons of freight a year, a large part of which could be better handled by rail, or by a coordination of rail and truck, President George Hannauer of the Boston & Maine R. R. declared in an address at the annual meeting of the Associated Industries of Massachusetts, October 18, at Boston. President Hannauer was addressing the transportation conference on the interdependence of New England railroads and New England industries, in the course of which he cited the unprecedented speed of changes that are going on in industry and in transportation alike as reasons for a mutual cooperation between the important industrial and transportation elements in New England's economic life.

New England's railroads, he said, under these conditions are obligated to aid New England industries by "(a) the best possible service, embracing adequate car

supply, speedy movement and dependable schedules; (b) the lowest practicable rates, consistent with a fair return on the funds invested in the railroads and establishing of sound credit; and, supplementing these two, (c) a further extension of the attitude and organization by the railroads to help New England industries grow and prosper.

"New England's railroads by the same token must have the support of New England industries: (a) New England industries should see to it that the railroads are advised of the conditions that the industries must meet in order to reach and hold competitive markets; (b) New England industry should interest itself in seeing that New England railroads receive fair consideration in matters of taxation, legislation and regulation, and (c) New England railroads should have the support of New England's industries in obtaining for the railroad and its allied services the fullest possible amount of traffic which can be justified under economic considerations. I refer here frankly to goods now moving on trucks, either common carrier, contract or private, which are shipped in many instances without full consideration by the industries of all that is involved, either as to maintaining an adequate rail volume to insure dependable train service and reasonable rates, or in some instances without consideration of the actual out of pocket costs.

-F. J. Koch Photo.

Transporting Race Horses by Motor Truck in Kentucky. Where the Railroads' Short Haul Business Is Going.

"The New England railroads in 1926 carried 7.3 per cent less freight originating in New England than they did in 1919. This fact has been advanced as evidence that New England is decadent. The fact is that New England industries between 1919 and 1926 actually increased their activities 9.2 per cent according to the New England business activity index of the Federal Reserve Bank of Boston, and if this increase is translated into tonnage, New England industries in 1926 used or produced nearly four million more tons than they did in 1919.

"Four million tons, then, is the approximate amount of freight which New England industries have diverted from the railroads to the trucks.

"Much of this truck traffic is moving uneconomically. If any large part of this four million tons of freight a year can be regained by or for the railroads of New England, through better service on our part, through closer coordination with motor vehicle service where that is the most efficient and

—F. J. Koch Photo.

An Itinerant Dry Goods Merchant in Kentucky Takes His Store to Kentucky Rural Regions by Motor Truck.

most economic means of transport, or through increased public recognition of the value of according to the railroads increased support by a larger volume of traffic, it will help much to enable the railroads of New England in establishing even better schedules, and in the end may even have a tendency to ease rates. There is a direct relation between the volume of business and the cost of handling it.

"Let me make clear the fact that much of this business moves more advantageously by truck than by train, because of its small volume, because of the short haul which is involved, or because of its relation to other traffic. The truck, like the automobile, has become a permanent part of the transportation picture, and some railroads, the Boston & Maine among them, are today using the trucks to good advantage under local conditions to which they are especially adapted.

"We have found that in some cases we can give a better service, and at less cost, by coordinating truck service with our through freight trains, and we are now performing such trucking service in Greater Boston, and on certain branch lines, as well as conducting our store door delivery operations between Boston and Lowell and Boston and Lawrence. In these operations we have used local truckmen entirely. The effect of this coordination is to move by truck those goods that can be best handled that way, to move by train those loads that are better handled by rail, and to move by truck and train still other classes of traffic. It is through such a rounded plan of coordinated transportation that the industries of New England and the railroads of New England will find the best mutual results, I am convinced."

Railroads and Motors

In the opinion of Frank Alfred, president of the Pere Marquette Ry., the railroads cannot reasonably object to any loss of traffic to highways, waterways or other form of transportation, where such transportation is more economical than that afforded by the railroads. "In fact," says President Alfred, "such objection would be quite futile, for just as surely as water seeks its level, so will the best method of transporting all classes of business be eventually reached. The railroads may object, with reason however, if competing transportation facilities are aided either by direct subsidy, by being granted free use of public improvements, by being relieved of taxation, or by being absolved from regulatory restrictions which must be borne by the railroads. As matters now stand, the railroads are regulated as to rates which they may charge, as to their dealings with their employes and the public, and in many other ways. They are heavily taxed, and a very considerable share of taxes which they pay is expended in the improvement of highways, to which they raise no objection. Commercial highway transportation, both passenger and freight, is not subject to regulation. Further, their right of way and roadbed are provided and maintained by the public, and they pay taxes only on the same basis as other users of the highway. Without raising here the question as to whether or not such virtual subsidy of commercial highway transportation is the best public policy, it may be stated that from a railroad man's point of view it does not seem quite fair, especially when the relative value of the service rendered the community by the two forms of transportation is taken into account. The absence of supervision of highway transport by a regulatory body is to be deplored. Irresponsible parties enter the business and operate for a time at less than cost, to their own ultimate financial ruin, and to the detriment of legitimate carriers. In such cases, the passenger or shipper has small chance of collecting damages where there is loss or personal injury. These features are not in the public interest, and no doubt will be corrected in the course of time.

"There is little doubt that the public would be best served by a system of transportation which included under one management, railway and highway transportation throughout the country."

Electric Lines Use 8,350 Buses

An interesting report just published by the American Electric Railway Association shows 367 electric railways operating more than 8,350 motor buses over 16,772 miles of route. This represents an increase of 29 companies, about 1,796 buses and 1,873 miles of route since October 1, 1926. In three years, measured by the number of buses operated, the industry has increased its bus operations more than four and one-half times.

The growth of motor bus operations by electric railways since 1921 is strikingly set forth in the following table:

ELECTRIC RAILWAYS OPERATING MOTOR BUSES

Date	Number of companies	Miles of route	Number of buses
January, 1921..	16	35	73
December, 1921	27	.....	131
July, 1922.....	38	.....	174
January, 1923..	56	878	355
August, 1923...	99	1,043	768
January, 1924..	110	1,300	1,100
August, 1924...	138	2,355	1,886
January, 1925..	171	4,285	2,660
September, 1925	251	12,060	4,452
March, 1926....	297	12,308	5,455
September, 1926	338	14,899	6,556
March, 1927....	367	16,334	7,777
September, 1927	367	16,772	8,352

It is noticeable from the foregoing table that the rate of increase of bus operation was considerably lower during the last 12 months than it has been for several years. While the number of buses owned and the miles of route operated are greater now than they have ever been, there is no net increase in the number of companies now using motor buses as compared with the number of companies operating them in March of this year. In fact, during the past six months 12 electric railways that formerly operat-

ed buses have discontinued their use, while twelve other companies not having previously used them have started to operate buses.

From these facts it seems evident that a normal point has been reached from which the number of companies operating motor buses will vary only by degrees in comparison with the rapid increases since 1921, while the use of this new form of transportation was being first tried out. On the other hand these figures indicate that the number of buses and the miles of route operated by those companies that have already adopted the bus to their transportation systems are continuing to increase rapidly.

There are more electric railways engaged in providing city service with motor buses than there are those giving interurban service. Of the 367 companies operating buses 158 provide city service, 71 give interurban service and 70 operate both city and interurban service. The remainder of the companies, 68 in number, did not report on this question.

All companies reporting were asked to say whether standing passengers were carried in buses after seats were filled. A comparison of the 239 replies received this year with the 199 received last year is as follows:

	Sept., 1926	Sept., 1927
Number of companies carrying standees	191	156
Number of companies not carrying standees	48	43
Total replies	239	199

New Service East

About 90 years ago the first stage service began between St. Louis and the West Coast. In those times the journey required 25 days if everything went smoothly and the noble redmen didn't object. Somewhat better service began October 29 from Chicago and St. Louis, to the coast, motor service established by the Pickwick Stages. The trip now can, it is said, be made in four days over paved highways. There were few agreeable persons along the route 90 years ago. Now there are 6,000,000 more or less pleasant and obliging, most of them with motor cars or airplanes.

—U & U Photo.

Along A Famous Highway to the West. The Santa Fe Trail Near Albuquerque, the Sandias Mountains in the Background.

The route of the system is that commonly known as the Ozark Trail, on which the principal cities connected are El Centro, Phoenix, El Paso, Amarillo, Oklahoma City, Tulsa, Joplin, Springfield, Mo., and St. Louis, offering an unsurpassed variety of scenery. Passengers may encounter a trifle of dust en route but at least they will get through with their hair in place, which was not at all certain in the early days.

Try Philadelphia, Walter

Walter Richards of Minneapolis, Minn., is tired of automobiles and pines for a nice quiet ride in a buggy, or something like that behind a prancing horse. But he cannot get his wish fulfilled. For two weeks he has advertised and searched for a landau, victoria, concord or a chaise and has been unable to find one.

People whom he has approached about such vehicles, have got real rude, Richards declares, because they believe he is kidding them, on the order of the fellows who were sent for square augurs or left-handed monkey wrenches. They even laughed in his face when he sought to buy a plain horse and buggy. But he says he is going to continue his search until he finds what he wants.

Choosing A Chauffeur

The American Railway Express Co. is mighty particular in selecting men to drive its trucks. M. T. Hanrahan, superintendent of that company's motor vehicle section in Chicago, said at St. Louis last month:

"We consider our vehicles no place for half-wits. Too many chauffeurs today are only a lap ahead of their keepers. We consider our first and most important step, the careful selection of candidates for chauffeurs positions. Having done this, we put our applicant drivers on probation for a period of from three to six months before they are eligible for a permanent position. At the beginning of the probationary period, a corps of instructors take the candidates through a rigid course of instructions, covering the mechanical features of a truck, traffic regulations, etc., after which, the candidates are given a driving test under the ob-

servation of the instructors, through traffic conditions which our regular chauffeurs meet daily. During this test, each candidate is carefully watched to determine if he has the proper mental balance to operate successfully one of our trucks. A man may pass the mechanical tests and still not be a safe man to operate so dangerous a vehicle as a motor truck. The instructor, at the conclusion of the test, makes a report to his superintendent showing how the candidate reacted to the various conditions met in the test.

"The superintendent determines from this report if the candidate is desirable. A further requirement is the test by city authorities, unless he has passed this before applying to us. Thus in the case of every chauffeur there are two checks on his competency. No chauffeur should be allowed to work out his own salvation. Rather should a carefully worked out set of principles or rules be laid down and the man held strictly accountable for their observance."

The Deadly Grade Crossing

A total of 1,062 persons were killed in grade crossing accidents in the first six months of 1927, according to reports filed by the railroads with the Interstate Commerce Commission. This was a decrease of three compared with the same period last year.

Persons injured in grade crossing accidents in the first half of 1927 numbered 2,901 compared with 3,110 in the same period one year ago or a reduction of 209.

Reports showed 2,561 grade crossing accidents occurred in the first six months this year compared with 2,644 in the same period in 1926 or a reduction of 83.

A slight decrease in the number of accidents and fatalities at such crossings in the face of an increase of more than two million in the number of automobiles in use indicates that some progress is being made in the safety campaign.

A Compact Steam Driven Car

The result of eight years' experiments looking to the utilizing of steam for transportation in a new way, safely, compactly, silently, and at the same time economically, is shown in the illustration herewith of the Locomotor. This is the product of collaboration by the Railway Locomotor Co. and the International Harvester Co. The new power plant is shown installed in a 73-ft. passenger and baggage car, but it can be built, it is said, to suit any standard car design.

The Locomotor requires but one man to operate it, and this may be done from either platform. It operates at full speed and power in either direction, and connections for operating controls are provided at both ends. These controls consist merely of the well understood throttle, reverse lever and air brake valve handle.

The fuel used is any ordinary grade of distillate readily procurable in the open market. Service records of an installation with driving engines of 300 horsepower, show a fuel consumption of one gallon of distillate for each one and one-half running miles or over 100 ton miles of operation; this, with a fuel costing five to six cents a gallon at present market. The distillate, completely vaporized, is used in a special burner in the heart of the steam generator. The combustion accomplished by this new type of burner is complete, as verified by the leading fuel engineers of the country. One of the best illustrations of this thorough combustion is the fact that the burner and tubes, after two years of heavy service, have accumulated no carbon deposits. Analysis of the spent gases shows carbon-dioxide with a slight excess of oxygen. There is no carbon-monoxide in these gases which are at all times invisible.

The flame of the burner is perfectly controlled by the steam pressure in the generator. This control operates within very narrow pressure limits. When the pressure reaches 600 pounds the flame is immediately extinguished, and when the pressure reduces to 550 pounds the flame is instantly turned on.

The circulating system of the generator consists of a storage and separating drum and over a thousand feet of spiral tubing, comprising three concentric coil systems for preheating the feed-water, evaporating it, and superheating the steam. No connections in this triple coil system are exposed to the burner flame or to the gases of higher temperatures. The full operating water content of a unit of 350 engine horsepower is 55 gallons.

Steam is generated at 600 pounds pressure with 200 degrees of superheat. The heat from the burner is thoroughly utilized in steam generation, in preheating the feed-water, in heating the air for the gasifier, and in properly insulating the unit containing the storage steam. As a result of this heat utilization, together with the arrangement for drawing air from the car into the generator compartment to supply the blower, no heat reaches the passenger and baggage compartments.

The automatic pressure regulation, and a balanced steam storage provided in the system, insure a constant supply of steam at operating pressure. On the other hand, the volume of steam in any unit is so small and is distributed through so many lineal feet of the system, that actual demonstration proves it to be insufficient to cause any property damage or personal injury. The pressure control of the flame and a duplex water supply safeguard the tubing itself against rupture from within and scorching from without. Full operating pressure can be obtained in from five to eight minutes.

The mechanical and shop departments of a railroad organization are more thoroughly familiar with steam than with any other

type of power. There is nothing about the Locomotor which such an organization cannot understand perfectly after a very brief examination. There are no "don'ts" or eccentricities about the Locomotor. It can be put through its performance and cared for by the regular personnel without incurring additional expense for employes with special training.

The fuel tanks are ordinarily designed to carry sufficient distillate for 350 to 400 miles operation, but fuel carrying capacity can be arranged to meet any individual condition as there is no explosion danger involved in carrying quantities of this kind of fuel.

The water carried in the power plant for steam generating purposes is only the approximate quantity which would be required for cooling an internal combustion engine of equivalent power. As only three or four gallons of new water are used per day in ordinary operation, the auxiliary supply may be fixed to suit any condition. On account of the small consumption and the distilling action of the generator, it is not necessary to provide distilled, treated or carefully selected water. The use and condensation of steam make it available in cold weather for heating the air circulation in the car.

Research and experiment by the two companies interested in the development, have pointed out the proper balance between fuel feed and air blast; between burner capacity and water feed; between diameter and volume of the different series of coils; between gases generated and the sizes of passages and outlets for them; between generators, engines and condensers; hot well and pump; in fact, between each component part and its related parts throughout.

When it is considered that within two or three minutes after the main burner is lighted, the generator has built up the 600 pounds operating pressure from cold water, it will be appreciated how well these balances have been worked out, and how readily such a power plant will respond to automatic regulation which calls for fuel and flame only when the pressure is used down to 550 pounds.

A New Steam Power Plant Installed In a 73-Ft. Passenger and Baggage Car. The Locomotor It Is Called.

The Locomotor is now demonstrating that it is cheap to operate, simple and inexpensive to maintain, reliable and amply powered. Its operating and maintenance economies can be readily appreciated by those familiar with transportation and motive power problems. It is attractive to patrons and the public generally because of the absence of noise and vibration, smoke and noxious gases; because of its riding qualities, smooth starting, and ability to maintain any reasonable schedule.

More Group Insurance

What is said to be the largest insurance policy involving two St. Louis concerns has been underwritten by the Missouri State Life Insurance Co. for the Missouri Pacific Railroad. The group insurance policies will be extended to approximately 9,000 employes in the mechanical department of the railroad. It is believed they will average about $2,000 each in value, or a total of $16,000,000 to $18,000,000 of life insurance in addition to an equal amount of accidental death and dismemberment benefits and a very substantial volume of accident and sickness weekly indemnity coverage.

In making the announcement of the arrangement, President L. W. Baldwin of the Missouri Pacific Lines explained that the plan is cooperative, the railroad company paying a part of the premiums and the employes paying the remainder. The plan was made effective October 1.

Air Traffic Cop Needed

A "hit and fly" aviator swooped down over the harbor police boat Guardian at quarantine, New York, Oct. 30, carried away the vessel's mast and zoomed away before his plane could be identified. Scores of passengers on the decks of the liner Celtic, just in from Liverpool and Queenstown, witnessed the thrilling spectacle.

The plane circled about the steamship from a height of about 1000 feet and then suddenly dived toward the water. As it struck the mast of the police boat it wobbled and seemed about to crash, but recovered, rose quickly and continued its flight.

Among the Men Who Do the Work

"WHAT chance has a street car conductor today? He can never become anything else. The minute he takes such a job he admits to the world his business ability is nix, that he could not hold down a bigger and better job."

This remark was made by a young conductor in a midwestern city to a passenger who had asked him in a friendly way how he was getting on, says the Electric Railway Journal.

That same day in the same city the newspapers carried the announcement of the appointment of Harry E. Littig to be general manager of the Peoples Light Co., a $6,000,000 corporation. He had worked his way up from the bottom. Mr. Littig is only in his forties and his future in the field of business is still an open road.

With This Motor Truck Loads May Be Taken Directly Into the Car Thus Avoiding at Least One Handling.

Leaving an Iowa farm, Harry Littig, a lad of 20, worked his way through a six months' course in a business college in which unusual ability for figures was indicated. This course finished he applied for a job as street car conductor. Although he was under the required age of 21 the railway manager hired him. He liked the boy's looks. For a year and a half the young man ran a street car. His reports were so neat and his cash balanced so well with his trip sheets that on heavy days and during rush hours the manager put him on congested lines to collect fares.

One morning Littig heard the cashier was ill and applied for the job.

"Do you think you can do it?" the manager asked doubtfully.

"I'd like to try," the young man answered.

Pointing to the safe where the receipts of the runs during the last 12 hours were deposited, the manager handed the applicant the combination of the safe and said: "Go to it." A half hour later Littig said: "I have finished this. What shall I do next?"

Much in doubt as to its accuracy, owing to the record time in which the cash balance had been arrived at, the general manager checked the work done.

"It's the first time we've had an exact balance in six months," he commented. "We'll try you out."

Becoming cashier, Littig soon fell under the bookkeeper's eye. "Ever do any bookkeeping?" that worthy asked.

"A little," was the reply.

"Then you might as well help me out." the bookkeeper replied. And soon the cashier was doing most of the bookkeeping as well. Several months later the management made the young cashier the bookkeeper. Always knowing how to work and always willing to work, Littig became, as the years went along, chief clerk, assistant treasurer, assistant secretary and then secretary. While he was growing his company was also growing. From a railway undertaking it had grown to a railway and light enterprise. Today it is a subsidiary of a $190,000,000 corporation, the United Light & Power Co.

Never lose your temper. Many men have the idea that the display of temper is a sign of strength, of the power to direct other men. The truth is, of course, that temper comes from lack of self-control, and is, therefore, an indication of weakness. — Henry L. Doherty.

Every person has two educations—one he receives from others and one, more important, which he gives himself.

Editorial Comment

Thanksgiving

NO OTHER country in the world except the United States of America gives formal expression of thankfulness once a year for the blessings conferred upon its people by Providence. True, it seems impossible to do this without eating more than we should, but the example was set for us a long while ago by the dear old Pilgrims who had a particularly bountiful meal made up of things they worked very hard to get. That first Thanksgiving Dinner was eaten by men and women who knew a great deal more about really hard times than this generation can understand. One needs to read again the history of those days, of the heartbreaking hardships the little band of pioneers lived through, to appreciate what a really easy time we are having in 1927.

Thanksgiving day, like New Year's, is a fine time for taking stock, for looking over our affairs. There is much reason for thankfulness this year, as there is at the end of almost every year, if only we check the successes against the disappointments that balance life. Such an accounting almost always shows that the good things outnumber the bad, that there are more successes than failures. Failures, it should be remembered, are the warnings that keep us straight along the way.

The country is more prosperous than it ever has been. We are at peace with the world, and this is a real cause for thankfulness. We have had some bad days, of course, but they are followed by better ones, just as blue skies follow the rain.

Even railroad men have something to be thankful for, if only they will figure up the year's events. They should for instance be glad the famous net return is no lower than it is today. The railroads have been doing pretty well, and cause for happiness may be found in the reflection that they have done a great deal worse. Congress will not convene for nearly a whole month, and surely this is reason for sincere thanks. Indeed, we may not for another two years, have quite so much reason for joyfulness and gratitude as we now have. Let us, therefore, join the popular spirit and celebrate the day, just as if congress were about to adjourn.

Slow Motion

It took a long while for the government to get around to it, but it was inevitable. The prohibition "enforcement" gents are going to padlock Pullman cars in which liquor is carried, and put them on sidings for one year. Every little while something happens to increase equipment orders. A lot of new side track will be needed, too.

There Must Be Some Way

The countrywide air express service has no armed guards. R. E. M. Cowie, president of the American Railway Express Co., supplying the service, says they aren't needed. The value of any one package sent by air express is limited to $5000, but 20 or even 50 such packages might be shipped on one plane. Such a load would be one which the bandits of a wilder day would have considered well worth their attention.

"But there aren't any aerial holdup men yet," Mr. Cowie said. "No express company guard, not even an unarmed one, will ride the planes."

All the Club Privileges

For some time it has been possible for passengers on the Union Pacific's finest through trains to sign their checks in the diners, and settle up at the end of the journey. If the members of the family prefer to eat by themselves but haven't the price without disturbing father to get it the steward will give them credit. This is very interesting news but still more interesting is the assurance of one of the stewards that no one had yet left the train without paying his bill, day or night. Doesn't this give you renewed confidence in the all round decency of human beings?

Preparatory Time

Trainmen know the meaning of the words in this headline. The passenger conductor who dashed into the station just in time to catch the train of which he was to take charge—well, he just wouldn't take charge. There is a fine moral in this little illustration. Lord Nelson once said he owed all his success in life to being always a quarter of an hour ahead of time. In the main offices of the Western Union Telegraph Co. in New York, Chicago and other large cities a man who reports for work three minutes late doesn't go to work. There are extra men present waiting for his job. It does pay to be on time.

Work and Success

Practically all big, successful men say much about work. All of them worked hard in their younger years, and never so hard, many say, as after success had been achieved. All these men have great re-

spect for labor. Few men worked harder than the late Marshall Field. In his closing years he talked much of the value of time, of perseverance, the pleasure of working, the obligations of duty, economy, patience, and the improving of one's talents. Boys and young men often grow restive when they hear these things, but they remain, nevertheless, as firm as the everlasting hills.

But Nothing About Trunks

For 55 cents you can now buy a set of eight little booklets telling you how to pack all kinds of things ready for shipping. They were prepared by the packing section of the transportation division of the United States department of commerce. What the country needs is a set of books written by a committee of women telling how they pack the possessions of a large family in one trunk, and then close the thing.

Our Name

The word Transportation is of Latin origin and is derived from "trans," across, and "porto," to carry. By derivation, then, Transportation is concerned with carrying across or transferring things capable of movement.

It is our hope that the minds of many of our readers are so mobile that through these pages we may be able to carry across new ideas, new thoughts so that the readers themselves may profit and the great transportation industry advance.

Pests of Various Kinds

The California department of agriculture has been worrying dreadfully. Throughout all the recent new interest in aviation there seemed no chance for this department to break into the news. But it's all right now. One of the bureau chiefs has discovered that airplanes are a very serious menace to agriculture. There is grave danger of their spreading insect pests over the country and of course this will call for very strict supervision. Planes will be subject soon to state quarantine. It may be necessary to stop them at the state line and put them through a fumigating process. Just what kind of bugs like to travel by plane has not been disclosed but probably there are specimens in the state house.

It Has Been Done, However

In his interesting little brochure, "The Present and Future of Electric Railways," Britton I. Budd, president of the Chicago Rapid Transit Co., and other things, says, "No one believes a transportation company is going to rip up its rails, its power lines, its other properties, and quit providing communities with transportation service at the end of any fixed franchise period of 20 or 30 years."

Nevertheless, this is precisely what has happened in a good many instances, Mr. Budd. And, meanwhile, resenting the charge of pessimism if made, it might just as well be realized that a good many more companies will rip up their tracks and things. The way to avoid this is to give such excellent service that the public will help you to keep your franchise or get a new one.

Is This True Now?

"Although freight brakemen do not have any intercourse with the public, they somehow learn the ways of the world very quickly," says American Railways, a book published 40 years ago. "The brightest ones among them need very little training to fit them for a place on a passenger train where they are expected to deal with gentle ladies and fastidious millionaires, and bear themselves with the grace of a hotel clerk. Perhaps one reason why brakemen impress their characteristics on the whole personnel of the service is because they have abundance of opportunity for meditation. Many of them have a superfluity of hours and half-hours when they have nothing to do but ride on the top of a car and keep a general watch of the train, and they have ample time to think twice before speaking once."

There Ought To Be a Law

Stunt flyers succeed, usually, in doing just two things, even if they escape a crash: They risk their own lives unnecessarily, and they hurt aviation. Of what possible scientific value was the crazy stunt of Gerhart Fieseler at Bonn, Germany, a few days ago, in flying upside down for 15 minutes? Why should a man try, as several have done, unsuccessfully, to loop the loop on the outside of the loop? What do these reckless flyers prove, except the fact that they value their lives very lightly? In the opinion of the average sane person the achievements or failures of stunt flyers are in a class with the strange accomplishments of pole-sitters, or men who seek records as coffee drinkers or pie eaters. Just as long as men will make fools of themselves for money a part of the populace will gasp at their doing it. There already is too much government in this country, but a little bit more might be welcome if it could put a stop to stunts that detract from the dignity of the great science of aviation.

Air Advisory Board?

Things are moving along fast nowadays. Soon we shall have a regional advisory board for air service. Obviously, something must be done to forestall a plane shortage. Already the Pacific Coast transportation advisory board has added one committee to its organization for the express purpose of putting shippers and producers in direct contact with air

service facilities, and this committee will function precisely as regional boards have been functioning. Air transport companies will be told where their facilities are needed and when, and the shippers will learn in advance just what service to expect. Shades of Jules Verne, and all that sort of thing!

The Second 100 Years

What a mountain of costs has risen to confront railroad managers since the beginnings of steam transportation! In the first 25 years of the Baltimore & Ohio, by which time the line had reached Wheeling, about 30 million dollars was spent for the project, including equipment. Not long ago this magazine asked one of the railroads, the Rock Island, how much it cost to provide for such trains as the Golden State Limited. The reply showed that 13 locomotives are used in operating this train between Chicago and Los Angeles. Those locomotives cost about $872,000. The service requires ten dining cars, six baggage and mail cars, eight Pullman club cars, and 36 Pullman sleeping cars. This equipment cost $3,500,000. With the locomotives the company has an investment of nearly $4,500,000! Add together, if you wish, the cost of several such trains, the Santa Fe's California Limited, the Chief, the New York Central's Twentieth Century, the Pennsylvania's palatial fliers, and all the other wonderful trains rushing across this country day and night, equipped with all the conveniences and comforts of club, hotel or home, and you can not fail to realize that transportation by rail has become a most marvelous thing in the last hundred years, but particularly in the last two decades.

The Station Agent's Job

As has been said many times, no one man makes a railroad, but one man can injure it so seriously in public esteem in just a few moments that the damage may be very difficult to repair; and this one man is the station agent. All employes' jobs contribute toward the whole result in public opinion, good or bad. The station agent, like the paying teller in a bank has an extremely important position and carries heavy responsibilities, usually for entirely inadequate pay. But an agent's future advancement is largely in his own hands. He can make himself so necessary that the company can not afford to lose him. He is, indeed, the railroad itself. He is in sight always, and therefore should be careful to keep himself pleasant to behold. A frowzy, unkempt agent, like a spotted, untidy passenger conductor, is an affront not to be tolerated. The article in this issue by a Union Pacific agent carries an important moral. Every agent, everywhere, ought to read it.

Progress and Optimism

Robert Dollar, president of the great steamship company bearing his name, is a real optimist at 83 years. Here's what he says about his part of transportation:

"I figure I've only twenty years more to work in the shipping business, and I'm darned if they can do much harm in twenty years. However, we cannot pass lightly over anything these days—so many things have taken place lately. I am expecting anything, for nothing today is impossible. I am not afraid airplanes will drive my ships from the seas."

Commenting on this viewpoint, the Worcester, Mass., Telegram says:

"Ships will continue to sail the seas. Trains will continue to roar over the rails. But the supremacy of the liner and the express train is apparently over. It probably will not be long before anyone who is in a tremendous hurry to get somewhere will go by air. But the most wonderful flying machine which can ever be devised probably will lack some of the romance of the ship and the railroad train. Progress can't be made without somebody's pride being hurt, without regrets and sadness somewhere."

Regulating Regulation

Government is a wonderful thing. No sooner does the average man become a part of its marvelous machinery than immediately he looks about for something to regulate. If he fails to make a noise the public may not know he's on the job. He is expected to start something. An attack on some public utility, usually a fight on its rates, always is popular with the oppressed citizenry. There is nothing new in this. When government needed authority to regulate the rates of utilities it was found in the Constitutional provision giving congress power to "regulate commerce * * * among the states and with the Indian tribes." Upon those few words has been erected the cumbersome superstructure of regulation for railroads, telegraph and telephone, the Pure Food and Drugs Act, and much more—including the noxious Hoch-Smith Resolution.

It has been suggested the entire rate structure needs rebuilding. A virile gentleman in Ohio added a wing to his house every time a child was added to the family. After a while it was apparent the structure was shaky and would better be torn down. But it wasn't the house that needed regulating.

Is There An Aunt Sarah In Your Shops?

Dr. Julius Klein, director of the bureau of foreign and domestic commerce, said several important things a few days ago in addressing the Associated Business Paper Editors at Chicago, but none more important for railroad men than this, in reviewing the industrial outlook:

"I ventured the opinion some time ago that in

several of our older industrial establishments there are still too many 'Aunt Sarahs'. She was the good lady, you will recall, who inherited a shoe factory and insisted that the plant continue to turn out high button shoes because 'Uncle Ezra' had made it pay with that line in the seventies. Nearly 44 per cent of the machinery in one important industrial group is more than ten years old, which in these days of strenuous competition and constant change threatens to get pretty close to the border line of industrial senility."

Industrial senility is particularly good. No plant or shop can turn out good work with old, obsolete machinery. You can do a good many interesting things in a Ford plant but you can not turn out Cadillacs or Packards. You would need Cadillac tools and materials.

You Take Your Choice

In addressing the convention of the National Association of Railroad and Utilities Commissioners at Dallas, October 18, President Atterbury of the Pennsylvania Railroad was reported by the Associated Press as saying:

"Huge investments are responsible for better service. We now are given proper returns on capital invested."

Speaking before the Illinois Chamber of Commerce at Chicago, October 13, President Willard of the Baltimore & Ohio, said, according to the report sent from his own office:

"The commission has fixed 5¾ per cent as a fair return within the meaning of the Transportation Act * * * the roads as a whole have not been able in any year since the passage of the act in 1920, to earn thereon, including subsequent expenditures, the percentage return which the commission itself has said would be fair, although that result was nearly reached in 1926."

Naturally, these statements confuse the inquisitive public. General Atterbury probably was speaking only of the Pennsylvania's return, while Mr. Willard referred to the roads of the country as a whole, a distinction not likely to mean very much to the man in the street.

Again, the Resentful Graduate

A thoughtful young man who signs "Resentful Graduate" to his letter, writes in to say that colleges are turning out too many engineers. When this chap finished a four year course in that profession one of the railroads offered him a job tapping wheels—car inspecting. The young man has some justification for his complaint. A good many Resentful Graduates have become wheel tappers, have been forgotten by the railroads, and never have come out of obscurity. Such stories are discouraging. If a college man can't do better after all his years of study, than to be a car inspector, education, he argues, is a loss.

Obviously, there aren't enough presidencies to absorb all the fine young engineering graduates, either on railroads or in other industries. But there are other places, and, speaking to the railroads alone in this instance, the Resentful Graduates have a right to feel assured they will not be forgotten if they do become wheel tappers. If the railroads and other big industries don't make it a rule to watch these youngsters, wheel tappers or rodmen, there will be a shortage, one of these days, rather than a surplus in its engineering ranks. If boys are to work hard in college it will be necessary to show them the things they learn really have some value.

The Growth of Air Service

This magazine is interested in aviation to the degree in which that industry affects and may in the future affect the carrying of passengers and express by steam railroads. The flight of Colonel Lindbergh from New York to Paris fitted into the program because it revived public interest in flying. The business-like air tour of the country just completed by this young man without a solitary accident, and with remarkable faithfulness to schedule, comes properly within the magazine's interest because it gives further proof that careful, competent men—meaning well-trained men—are likely in coming years to make successful the carrying of human beings from place to place in safety at least as certain as by railroad.

Colonel Lindbergh's tour led him into every state in the union. He visited 82 cities. When he was announced to arrive at 2 p.m., it became customary for the crowd to be there at that time, and never once did the flyer disappoint a town. Invariably, at ten minutes before the hour, the Spirit of St. Louis flew gracefully to its landing. In three months Lindbergh flew 22,600 miles in 260 flying hours, and at the finish his plane was reported in perfect flying condition.

Meanwhile, in these three months, what tragedies have been enacted in the air! Men and women, seeking to duplicate or surpass Lindbergh's feat, have flown away into Unknown Space, and never have come back.

Meanwhile, also, the Air Mail goes on about its business, carrying letters and express, unnoticed very much by anyone because it is managed by flyers of the Lindbergh type of common sense. The Western Air Express, for example, has flown more than 750,000 miles without an accident, and has transported about 700 passengers safely, most of the journeys over lofty mountains and some of the wildest country in America.

Incidentally, this company also has paid dividends, but it has not yet come under the fostering regula-

tion of the government, so the stockholders should not be unduly enthusiastic. The worst is yet to come. Air service never will have to maintain 275,000 miles of roadbed. It can fly complacently over local and state taxing centers and be captured by the assessors only at terminals. It need never worry its heart over grade crossings. But of course it can not entirely escape the fools. These poor creatures, as on the earth's surface, soon will be flying everywhere, killing one another in the air as they are doing down here with motor cars. Fools we have with us always.

Railroads and Steamships

The cooperation of steamship lines in contributing exhibits to the Baltimore & Ohio Centenary at Baltimore draws attention to the fact that this was the first railroad to establish a steamship line to Europe. This was in 1868. This historical reference is particularly apt just now in view of the suggestion by the astute Edward N. Hurley of Chicago, that American railroads, by the ownership and operation of ship lines, can assure an adequate merchant marine for the United States. Mr. Hurley has not been greatly in the public mind recently but he will be remembered as the Chicago business man who directed the construction and launching of three ships a day at the peak of America's war time effort—a feat never equaled or even attempted by any other nation.

Mr. Hurley, in agreement with President Coolidge, believes the government should get out of the shipping business and stay out. In railroad ownership of that business, he sees a proper solution for an extremely troublesome problem. Railroads, Mr. Hurley says, are already in the transportation industry. They understand it. They are represented abroad today everywhere and are recognized as transportation experts. They have credit. They are accustomed to handling big business in a big way. They have big men to do the work.

Indeed, it is very likely the railroads would now be in the steamship business, as they should be, if it were not for the hampering hand of legislation which, since 1914, has kept them out of it. Such regulation in this and a hundred other departments, took the heart out of executives. Until the particular legislation referred to has been repealed railroads can not go into the steamship business.

There are other obstacles, as Mr. Hurley knows, but they are not insurmountable. The government can make it easier to realize Mr. Hurley's plan, not with subsidies which are abhorrent to sensible Americans, but with an attitude of acquiescence and confidence. In this way the President may help to further his own plan also. Practically everyone of experience in such matters favors an American marine; but it should be privately owned and privately financed, and the losses, if any, should be borne by private capital. Mr. Hurley says of this proposal:

"If our great railroads that are now so well managed but confined to the transportation of foreign and domestic freight between the various seaboards of this country, were to become interested in extending themselves by operating a fleet of ships, our freight could move into the markets of the world under a single bill of lading, and the success of our merchant fleet would be assured.

"In this respect I should like to call attention to what the Soo Line railroad, controlled by the Canadian Pacific, is doing in this direction right here in Chicago today. This railroad will accept freight for any port in the world and move it by its own carriers to the final destination regardless of what country it may be. It is able to do this through its own passenger and freight shipping company—one of the largest afloat. And the through bill of lading which it gives the shipper may be presented at the bank and receive credit the same day.

"Many of our railroads have agents in foreign countries. These agents secure freight to be shipped over their lines in America. But in this way they get only part of the haul. They get the land part only because that is all they are equipped to handle. I cannot consider this good business.

"The operation of a merchant fleet by a railroad would materially reduce the cost of operation. Likewise, the expense incident to procuring freight and passengers for the ships would be cut to the minimum, compared with present methods which duplicate one another.

"More could be accomplished in five years by the venture of leading railroads into the shipping business than in twenty years of independent shipping."

Mr. Hurley's proposal is worthy of the most serious consideration.

If you wish to appear agreeable in society, said Lavater, a philosopher of long ago, you must consent to be taught many things which you know already.

Automobile owners of Poland are giving up their custom of selling their old cars to friends, and are turning them over to dealers.

The Editorial of This Edition

IF THERE is one subject which, more than any other, gets the attention of railroad managers, it is economy. Just what the word means is not quite clear to all men. Some are unable to see the difference between pinching pennies and spending money wisely. Some seem unable to detect the fact that up-to-the-minute machinery, thoroughly modern facilities, adequate power where it is needed, scrapping obsolete equipment of every kind is economy of the highest type. This kind of men will retire or discharge an old employe the day he reaches a certain age, but never think of doing the same thing with worn out shop machinery. This is reprehensible, of course, even when one realizes that a good many railroad men have to face the vanishing net return, but at the same time it is worth while remembering that no industry or business ever yet climbed out of a hole by operating methods that would have been condemned when railroads were young. To get modern

results you must have modern machinery. Modern mechanics can not work satisfactorily with anything else. The ruts of industry are filled with economic waste.

Just what is meant by economic waste, in addition to the particular items mentioned in the foregoing paragraph? A long time ago when oil and gas were discovered in Pennsylvania and, coming nearer to the more recent years, in Kansas, Oklahoma and Texas, street lights were burned day and night because men believed it cheaper to let them burn than hire men to turn them off. Oil was thrown about like water. No one paid any attention to it. This isn't permitted today. It was regretted long ago. When Gifford Pinchot and Theodore Roosevelt stirred up the country, years ago, over conservation of natural resources it was the most difficult thing imaginable for them to get respectful, attentive audiences or readers. This isn't the case now. Long ago the people learned that the country's forests and water power were being wasted recklessly, and laws were enacted that stopped it rather effectually. Certain kinds of timber neglected or burned for generations as useless, silver birch, hemlock, basswood, poplar, jack pine, are now being cared for, cut at the proper time for making paper pulp, and the ground replanted. Forest rangers are watching everywhere for the careless and thoughtless campers. Fires still are to be reckoned with but the government at least is awake to the danger. The government is fighting economic waste everywhere. Railroads can help. Many are doing it.

Some fairly big railroads called Class I lines are running beautiful trains every day and night out of archaic terminals where the cost of handling equipment, especially freight, is abnormally high simply because money has been spent in the wrong places or not spent at all. The big cities are glaring examples of this economic waste, and Chicago is one of the worst. Some of these railroads, saving money at one place and wasting it at another, still try to turn obsolete locomotives into switch engines regardless of the flagrant waste of fuel, and high maintenance costs instead of scrapping the old engines and getting power designed for the work to be done and which will pay for itself in a comparatively short time.

Others continue to run a lot of worn out old engines and wooden coaches on branch lines that haven't paid a cent to anyone except the train crews for years, instead of putting on modern motor cars or buses and scrapping the unprofitable tracks. This is economic waste, and you don't have to travel far to see it. This kind of railroad men will realize some day, perhaps, that first cost isn't the only cost. And on that score, too, it should be remembered that in buying new equipment the cheapest isn't necessarily the best, especially when intricate machinery, heavy locomotives, etc., are being purchased. It's the upkeep and the service they don't get that makes the difference between economy and sensible expenditure.

Obviously, the charge of wastefulness can not be lodged against some railroads. Their record for high efficiency is well established, but nevertheless it is a fact that some of the very largest are guilty of astonishing neglect in this respect. Possibly you have all heard at some time or other of the chap who wore a silk hat but no underwear. His counterpart is found in an important railroad which is nameless here. This line runs very handsome trains—the silk hat—but hasn't a respectable enginehouse on its line, very few modern ash pits, no worthwhile switch engines, no modern coal handling equipment; in short it is a pretty rattle-trap looking line most of the way. Neither has it paid out much in dividends. It never will until it modernizes its entire line, and necessarily this will take money. The only way to get money is to invest in money-earning machinery and equipment.

Waste is by no means confined to equipment and buildings. Dollars are made up of a number of cents, as some persons have discovered.

The Great Northern Ry., after a careful study of its stationery needs, made changes effecting a saving of $50,000 in one year. An employe of the Pennsylvania Railroad began, many years ago, to save string and wrapping paper, and almost before he knew it had worked himself into a highly lucrative position. The public, so prone to criticize waste and so profligate itself, little realizes how diligently railroad men labor to save money.

But railroads waste money and time, which are inseparable, in one way which, to the casual observer may seem unimportant. Perhaps you remember the story of the fish merchant in Fulton Street Market, New York, whose sign read "Fresh Fish for Sale." When he had changed this to suit the criticism of a friend from Boston, the sign bore the one word, "Fish." Obviously, said the critic, the fish were fresh and, of course, they were for sale. Why say so?

Have you ever noticed the perfectly useless words railroads seem to delight in painting on buildings and equipment? True, they have neglected to put "Locomotive" on the engines, but they have done about everything else. Why not say "Diner," "Observation," "Buffet," "Club," "Lounge," "Baggage"? Why add the useless word "car?" Anyone with intelligence knows it's a car. Often the words Baggage Room, Lunch Room, are used when just one word would tell the story and cut the cost of the sign in half. If string and paper and old spikes are worth saving, aren't paint and time in the same class?

At first glance the idea seems trivial, but what might a national committee say about it?

Washington All Set for Congress

Mostly Politics in Sight

By W. E. Hopkins

WITH congress immediately in the offing, attention in Washington is focused on the legislative outlook for the railroads. The coming session probably will be a busy one, particularly in view of the fact that 1928 will be a presidential year. While many attempts will be made to enact legislation affecting the rail carriers of the country, a doubt remains in the minds of many close followers of the situation as to whether much can be accomplished. There seems to be a prevailing opinion that for the most part the next congress will be a political session with all factions playing to the great gallery of voters throughout the land. In view of the fact the socalled radicals will hold the balance of power in the senate although the Republicans will have a paper majority, there is considerable doubt as to whether a common agreement on major legislative matters can be effected between the senate and the house, the latter body being snugly under the control of the Republicans.

Immediately after both houses have been organized, the house will begin grinding out the numerous appropriation bills for various governmental activities while the senate is expected to devote its attention to the question of whether Senators-elect Vare of Pennsylvania and Smith of Illinois are to be permitted to retain their seats. Under the present plan both will be permitted to take the oath of office when the senate convenes, and this in turn will permit the Republicans with their paper majority to organize the senate. Under precedents established years ago, the Democrats will not attempt to interfere in this procedure. To do so might plague the Democrats in future years. That this is a certainty is shown by the fact that when Senator James E. Watson of Indiana, chairman of the senate interstate commerce committee was in a sanitarium recently with prospects of not being able to return to the senate for an indefinite period, Pat Harrison, the affable senator from Mississippi, telegraphed the Indiana solon and offered to pair with him not only on the organization of the senate but also on various legislative matters until Senator Watson could return to his seat. There seems to be a general understanding that if necessary the Democratic members would not be averse to absenting themselves when the organization takes place in order to insure the Republican regulars maintaining control.

Ranking first in legislative interest so far as the railroads are concerned is the railroad consolidation bill which, according to present indications, will be reintroduced by Congressman Parker of New York, chairman of the house interstate and foreign commerce committee and Senator Fess of Ohio. Hearings on this bill are planned by both the house and senate committees. There seems little doubt that the Parker bill can be passed without great difficulty by the house but tough sledding is expected when it reaches the senate owing to the radical strength, and the fact that every Tom, Dick and Harry undoubtedly will attempt to plaster it with amendments running the whole gamut of railroad legislation.

Supporters of the proposal made at the last session to abolish the Pullman surcharge have renewed their activity during the summer and fall months in an effort to bring that about and, according to reports received at the capitol, are extremely confident of being successful. Not only have they been active at the capitol but supporters during the past few months have been calling on various members of both bodies at home in an effort to pledge their support. Abolition of the Pullman surcharge would mean a direct loss to the railroads of about $40,000,000 at a time when railroad earnings, due to increases in wages principally, have shown a decline and are considerably below what is recognized as a fair return.

Senator Mayfield of Texas is expected to renew his attack on Section 15a of the Transportation Act as soon as congress reconvenes while supporters of the proposal to compel the adoption of the metric system of weights and measures, which would work a serious loss

on the railroads due to the change in the system of measurements, have also been extremely active, issuing long statements in behalf of their cause.

The long and short haul bill which has bobbed up year after year for decades also seems likely to be among those present at the next session. Legislation to relieve short line railroads from the so called discrimination against them in the recapture of excess earnings as provided for in Section 15a of the Transportation Act, it is understood, again will be proposed. A bill with this intent was introduced at the last session by Senator Pittman of Nevada but failed to reach the final states of enactment. Congressman Free of California, in a recent statement announced his support of such a bill which is also favored by the short line railroad association.

These and a score of other bills proposed in the last session without success are expected to pop up their heads as soon as congress meets.

Both houses unquestionably will devote much time to the consideration of legislation involving flood relief and taxes which with the appropriation bill will take considerable time. Proposal to reduce the corporation tax is of especial interest to the railroads.

No final action has been taken by President Coolidge in appointing a successor to Commissioner Hall of the Interstate Commerce Commission who advised the chief executive some time ago of his intention to retire owing to ill health. The name of A. A. Betts, chairman of the Arizona public utilities commission, continues to be mentioned as the possible successor but his friends admit that no promises in his behalf have been made at the White House. While many men have been mentioned for the place, it is understood, no final choice has been made. The name of Sidney F. Andrews, assistant director general and general solicitor of the United States Railroad Administration, which is now closing up its affairs, has been prominently mentioned. He is a Democrat, as is Mr. Hall, and hails from Missouri.

Cash repayments totaling $48,494,240 representing obligations of the New York, New Haven & Hartford R. R. to the federal government resulting from war time operation of its road have been announced by the treasury department. With this payment, the amount owed by that road is wiped off the slate, and reduces the amount now owed by various other railroads for the government's war time operation to $152,000,000. The original amount was approximately $400,000,000. In August $17,000,000 was paid on the indebtedness.

The Interstate Commerce Commission has fixed a final valuation for rate making purposes as of June 30, 1915, on the Pere Marquette R. R. of $62,705,398 for property owned and used for common carrier purposes, $3,410,305 for property used but not owned and $559,673, for property owned but not used. The carrier's books recorded an investment of $87,100,296 including lands and rights, which the commission reduced to $80,179,569 of which $77,465,425 represented the recorded value of consideration other than money.

A total valuation of $559,914,672 has been placed on the Chicago Milwaukee & St. Paul by the commission. The valuation is of June 30, 1918. On the date of valuation that road had outstanding a total par value of $613,990,054 in stocks and long term debt of which $117,406,000 represented common stock, $115,845,800 preferred stock and $380,738,254 funded debt unmatured.

Disposition has been made by the Interstate Commerce Commission of claims filed with it by the railroads for the guaranty provided by Section 209 of the Transportation Act, 1920, in the cases of all but 13 of the 667 carriers that accepted that provision. Records show 520 cases have been settled and 134 dismissed as of September 30, 1927, involving total payments of $529,892,619 while it is estimated that approximately $830,000 will be required to settle the remaining cases, in addition to advance and part payments already made.

The Interstate Commerce Commission has postponed until December 10 the effective date of the recent order issued by it reducing freight rates on deciduous fruits other than apples from California to all eastern points. The commission had previously postponed the effective date until November 10.

A Long Non-Stop Run

The longest non-stop distance covered by any train in regular passenger service anywhere in the world, is said to be the run of the "Daylight," a train for sight-seers between San Francisco and Los Angeles.

Two notable British non-stop trains operate from London to Newcastle, 268 miles, and from London to Carnforth, 236 miles. Another train is daily operated between London, England, and Glasgow, Scotland, without stop, the distance being about 400 miles. The "Daylight," a Southern Pacific train running daily in each direction between San Francisco and Los Angeles, exceeds the performance of any of these trains, making the run of 471 miles without stopping for passengers. The running time, 12 hours, is two hours shorter than that of any other train between the two cities. While the "Daylight" makes two stops for fuel and water, its performance is on the same basis as other famous non-stop trains on runs where the distance makes it impossible to carry sufficient fuel and water for the complete journey.

Little Stories About Big Men

Samuel G. Allen, Joel S. Coffin, and Herman F. Ball.

A GREAT change in the attitude of the American people toward what we call Big Business has come about in the last ten years. Not very long ago, it seems, orators were ramping about over the country denouncing all forms of corporate wealth. Trust busting was a popular sport. To be called a Big Business man was almost a blot on one's family name. The possession of great wealth was a suspicious circumstance in the opinion of many. Capital and Labor were at the well-known loggerheads. For many years it was a matter of irresistible force encountering an immovable object.

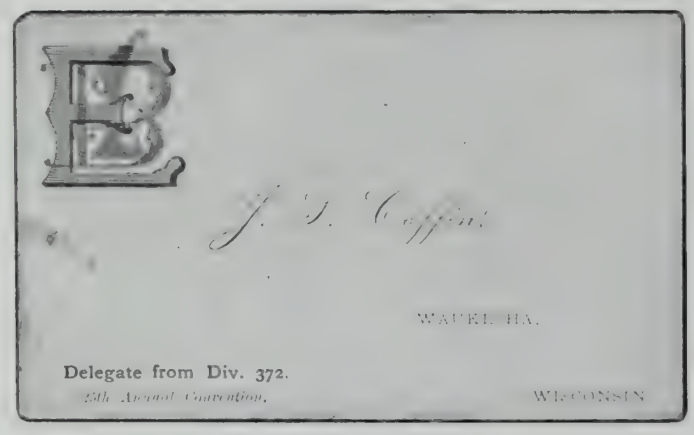
Happily, this has been changed. It took time and education and much tolerance. Common sense came into its own. The people awakened to the fact that they had been listening to thunder which, as everyone knows, is merely a sound. Today, the old trust buster would have a sorry time of it in a public gathering called to discuss the state of the union. Men have come to realize that while the compensations of life are sought in different ways by different men the ultimate goal is pretty much the same after all; that cooperation is a really wonderful thing when it is understood as meaning a getting together for mutual good; that neither Capital nor Labor would amount to much, one without the other, and that Big Business is only a higher form of united effort toward worthy purposes.

Joseph French Johnson of New York once said that when we consider that the rendering of service to humanity is an essential element of business, and that no business man can long be successful if he fail to render service, we must admit that a great business man deserves honor and respect just as does a great lawyer or physician. Business, Professor Johnson says, has made our civilization possible. It was Big Business of the highest quality that made our transportation system in America. Unfortunately, this still is unknown or misunderstood by the average person pretty largely interested only in his own affairs. He gives little if any heed to the origin or source of comforts and conveniences until, some day, they are denied him.

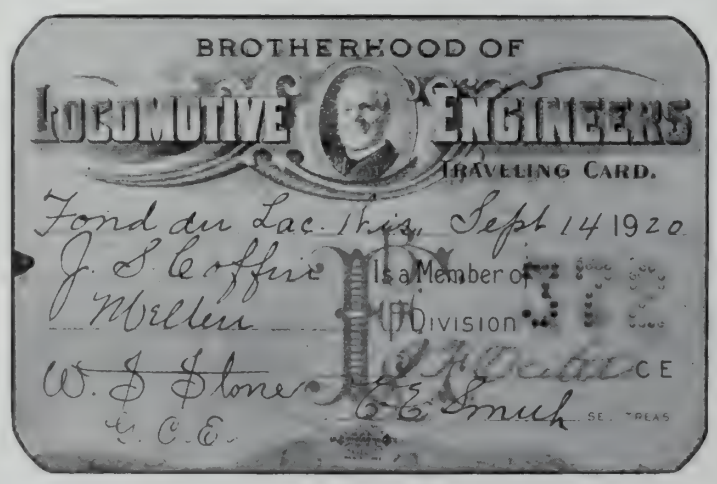
This magazine said editorially, a few months ago, referring to the building of locomotives, "The finished product is a wonderful thing when the public sees it, but what about the chap who gave his best hours to designing it, watching it grow into actuality, and then knowing, as no one else ever could know, the exquisite agony of mind in the final hour when everyone lived just one supreme question, 'Will it run?' "

If you have lived close to such things, if you have known the men and organizations that have produced the marvels of transportation that make life easy today you know just what Professor Johnson meant when he said that men who contribute greatly to the service of humanity are entitled to honor and respect. You would feel a glow of pride in belonging to a race that had produced the wonderful exhibits at the Baltimore & Ohio centenary, last month. You would be grateful to a mighty force to which much homage was paid, unfortunately: the inventive brains, the efficient organizations of men and

money that had made possible, the development of the locomotive and the great lines of railroad that cover the continent like a net. The representatives of this important element quite frequently are referred to as peddlers. But, like the engineers who go far in advance and mark out the way for a railroad where men have never been, these are the Commercial Ambassadors of progress who invent and make, and then sell, often to reluctant customers, the things of which transportation is made. It is they who have provided the machinery and the materials in the last hundred years, out of which has been fashioned the power that moves "men and goods from place to place."



No finer example of this progressive force is to be found than Joel S. Coffin of New York. If you belong to the intelligent minority which likes to know the source of things you know the name, and you know that here is a man who rose from humble beginnings to head the largest organizations in the world producing locomotive devices, the things that have made better, safer, pleasanter railroading everywhere. Locomotives, as doubtless you know, are no longer the product of one man as in the days of Phineas Davis and Peter Cooper. Like automobiles, they are assemblages of parts, specialties, devices, the inventions of men whose work has made possible the comforts and conveniences of travel and shipping as we have them today.



With scarcely an exception the big men of this country who have done things worth recording in history are the last to talk about them, like men who have come back from the war.

And, like the locomotive or the automobile, a story about such a man is made up of parts, fragments from friends here and there. With scarcely an exception the men who have done the really big things in the industrial life of the country are rather silent persons. Practically all these men have known hard times, great difficulties and disappointments, hope deferred. Very few started with the familiar silver spoon. Life has been a pretty serious business for them, in most cases. They have had to learn the importance of caution, accuracy and conservativeness that was not hesitation where action was demanded. They have been obliged to study men carefully. They have had to build up great organizations and then maintain them, very often in times of stress, so that nothing might be permitted to disturb the smooth and orderly operation of business upon which so much depended. Andrew Carnegie once said it would be a simple matter for him to recover from any business reverse if only his organization were left intact. Nothing is more important. Such organization is possible only when the head of it is certain of every man's loyalty, and this, of course, he can not have unless, as in the case of Joel Coffin, he is loyalty personified in his own relationship to his men.

Something was said a moment ago about humble beginnings. Most of the big men of this country began their earning careers in overalls. So true is this that it is perfectly safe, however trite, to say that his origin, his early environment, is no indication at all of what a boy finally will be in life. If he have the character, the determination, the intestinal stamina to do it he will, as history shows, lift himself out of any early discouragements. The books are filled with such incidents, Lincolns, Grants, Garfields.

Joel Coffin was born in St. Clair county, Michigan, in February, 1861, but his parents soon took him to the little town of Elmhall, in the heart of the Michigan Pine River region, where he grew up. Following the line of least resistance the boy would have developed into something or other in the lumber industry as thousands of boys, born into like surround-

ings have done. He was fitted by Nature for just such an assignment, and indeed until he was 18 years old there was some likelihood that this is what he might turn out to be, a boy of extraordinary size, great physique, what the people of the region called a real husk, a fighter with courage, as they had to be up there to survive. It was no place for a weakling. How many lumber jacks Joe, as they called him, actually whipped is not a part of the record, unfortunately for this epic, and perhaps it is not greatly important in the final result, but stories have come down across the years that give a thrill in the hearing. What basis there is for them will never be known. It would be easier to get the truth about what Pershing actually did say at Lafayette's tomb one April day than to get a word out of Joel himself. But there must have been some great times in the piney woods, and no arguments about the count. When a man was out he was out, and everyone present knew it.

Fate looks after things pretty carefully. Before he was 18 Joe Coffin tired of the big trees. His eyes turned toward the horizon and a brighter future. He wanted to do something. He thought of mechanics. He liked machinery. He wanted to develop—anything. He didn't know what it was, and few boys do know; but when he stretched out his brawny arms and realized the strength of them, he knew, somehow, that somewhere that strength might be used to more advantage than in 'rastling log chains.

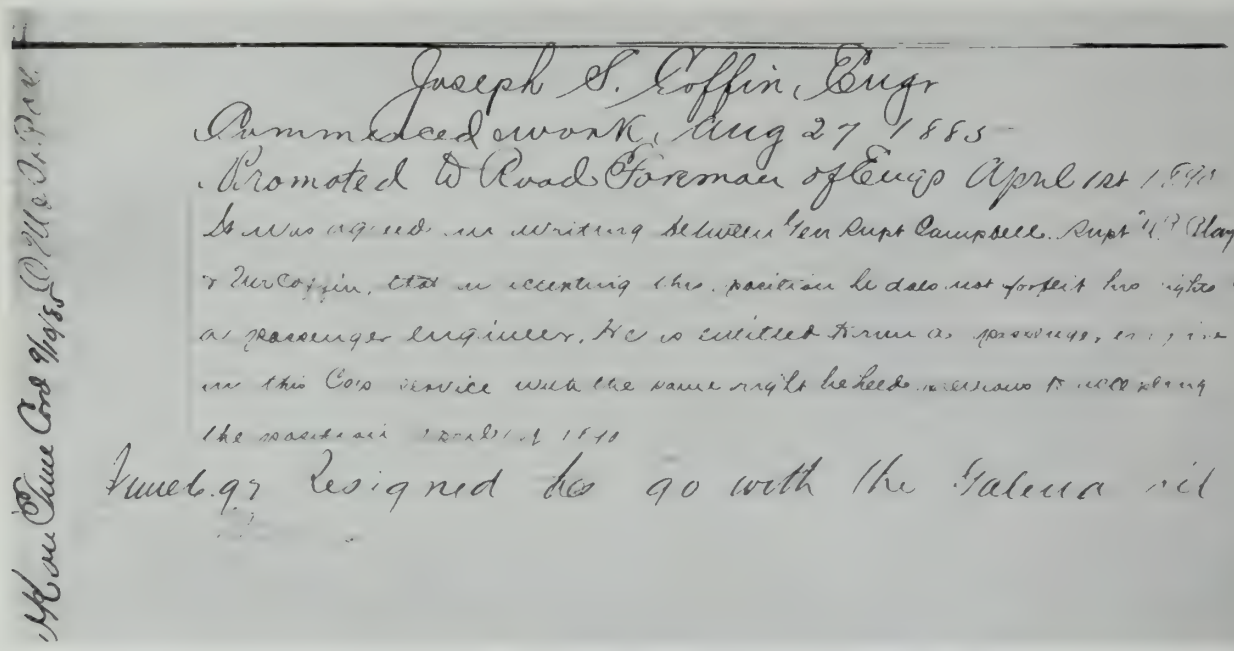
So, at 18 what did Joe do but enlist as a machinist's apprentice in the shops of the old Western Michigan Railroad at Muskegon. You probably never heard of the Western Michigan, and you never will unless you examine the internal records of the Pere Marquette Ry., of which it has long been a part. Eighteen months the boy stayed at his new job; low pay; he needed no kegs to store away his wages; and then it became apparent that he couldn't be overlooked. He was too big; furthermore he did what he was told to do as if he liked it, a rare trait. They made him a fireman — and that's hard work.

Joel S. Coffin

Some men, pretty good ones, too, are "job holders." They just stick. From among these come the malcontents, the trouble breeders in many cases, the chaps who would sooner growl to a little group at the back of the shop at noon time about their low pay than join the horseshoe pitchers in the yard with a laugh.

Joe Coffin was no job holder. He was looking to the future, and in his quiet, unostentatious way, he did his work and made people remember him. This kind of man thinks more about the possibilities of a job than the immediate financial gain. He's a "clock watcher" all right, but he watches it only in the morning in order to be on time. The result for Joe was that eleven months of firing gained for him an engine to run, and by this time he was moving; nothing could stop him; nothing did. In a little more than two years he went to the Wisconsin Central as a locomotive engineer, and in eight years he left the road as general road foreman of engines. Pretty good, sound training for the man who was to organize, combine, and finally to be the head of the great enterprises so important to the railroad business in every part of the world.

About this time the thought began to intrude itself in Coffin's mind that if he was going to take the place which, in fancy, he had set for himself it would be necessary to get out of the pay roll habit. Now this is a perfectly scrumptious thought which comes to most intelligent men at some time in life to be fondled a while, played with, loved, and then gently laid away forever as one puts old flowers in the family Bible where they know they'll never be disturbed. Cowards who fear to break away from a sure base of supplies! Most of


Joseph S. Coffin, Engr
Commenced work, Aug 27 1885
Promoted to Road Foreman of Engs April 1st 1890
It was agreed in writing between Gen Supt Campbell, Supt W. P. Hayes & Mr Coffin, that in accepting this position he does not forfeit his rights as a passenger engineer. He is entitled to run as passenger, in case in this Co's service with the same rights he held previous to accepting the position (signed) 1890
Aug 27 1885
Resigned to go with the Galena Oil

us are cowards. If we weren't there'd be no one to do the dirty work.

Joe Coffin was thinking, and thinking for him meant progress. In 1892 he quit railroading to go to the Galena Signal Oil Co., at Franklin, Pa., as railroad representative for the company. Four years later he was manager of the railroad department, and ten years from that time or thereabouts he was vice president, still on a pay roll in a manner of speaking, but much more agreeably so, if you get the idea. It was in this part of his business career that Coffin demonstrated his great salesmanship. It takes unending cheerfulness, good temper, patience, courtesy to be a salesman of this type. You can teach a green man to sell goods, some philosopher once said, but never a blue one. Coffin was never blue. When he entered a man's office he went in as the bearer of good news. He had good products certain to save money for the company. And he sold them, too.

It was while at Franklin that Coffin, with Samuel G. Allen, now and for many years his partner, organized the Franklin Railway Supply Co. In a couple of years he was vice president of the American Brake Shoe & Foundry Co., then head of the Franklin Railway Supply Co., which had been moved to New York. Here the man's great ability as an organizer asserted itself. Out of his untiring efforts there emerged the Superheater Company, the American Arch Co., the Rome Merchant Iron Mills, and with these activities came also the purchase of the Lima Locomotive Works, and of this entire group he has ever since been chairman of the board.

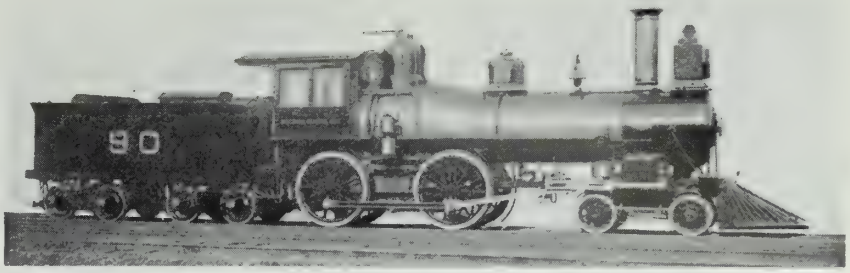
You might have to go a long way and search deep into the files to find a better demonstration of what we mean by the romance of business. We like to associate success with romance when we think of it in a business way, and there has been plenty of success here. Coffin has made money, certainly, as he deserved to do. He worked hard, he produced worthy goods, he sold them fairly through an organization so efficient and loyal to him—and he to it—that crises and emergencies were anticipated and beaten before they gained a start. Why shouldn't he reap the fair reward of his intelligent energy?

Sixty-six years young he is, today, and his two large fists are about as strong as ever. But now he does not use them to maul lumber jacks. With consistent and necessary attention to business he gives his strength to looking for lost balls on the diverting golf course of Englewood, N. J., where it is declared he belongs in the 80 class, which we hope is true. His summers he spends at Cape Cod when he can, which is usually. He is a Mason, too, but the thing of which he seems proudest, perhaps, among the associations of the years outside his very beautiful home life, is his membership in good standing in the Brotherhood of Locomotive Engineers.

You won't get these facts from Joe Coffin, but the pride he feels in the record of his hardest working days is shown in the framed membership card on his office wall; the care he has taken to preserve the record of his railroad years, a record he made when he was on someone's pay roll. These proofs of the father's industry are there for the boys to see. There are two of these boys, Charles William Floyd Coffin, now vice president of the Franklin Railway Supply Co., and Joel Junior, president of the Franklin Railway Supply Co. of Canada.

In the cloistered seclusion of an editorial office it may be we have

missed the exact meaning of certain terminology now current in some industries. We feel safe, however, in saying that Joel Coffin is a straight shooter, and we are not thinking of golf in this connection. We are thinking of the way he treats his employes; how he rewards merit wherever discovered; the painstaking care he gives as counselor for young men in the craft who need his great experience and advice to start them right; 215 pounds of American business gentleman. But no man could shoot in the 80s at Englewood and be anything else.



The 90 Was the Engine Mr. Coffin Ran in 1885-1890.

Electric Railway Progress

Speaking before the convention of the American Electric Railway Association at Cleveland, October 3-7, L. J. De Lamarter of Grand Rapids, said he believed the electric railway industry has been awakened to better understanding of its future progress and existence. "For the first time in the history of the industry," said he, "there has been a wholesome and concerted movement toward improved equipment, modernized service and greater public good will in helping solve the biggest problem confronting the industry today — successful merchandising of transportation, or, better explained, to effect a definite check of the downward trend in the number of passengers carried.

"Every progressive railway manager is primarily concerned with the subject of making transportation pay. How to give the long continued downward trend of passengers carried an upward turn is the momentous task that is worrying the industry.

"It has been demonstrated, and proved by reports, that in practically every property where new car equipment has been placed in service that they have succeeded in accomplishing satisfactory results in increasing car riding and better public relations.

"This does not mean that modern equipment alone is the answer to the big problem, but that the spirit of modernization must pervade the entire property, and be constant, before public approval and patronage can be won. Regularity of service with electric rail coaches featured by attractive appearance, interior comfort and quiet operation and manned by well uniformed employes who are conscious of their public trust and offer courteous service that wells from the heart, will go far toward restoring the electric railway industry to its proper place in the transportation world.

"Where modern cars have been placed in service, they have appealed to the public because they represent a new day in city or mass transportation. They have changed the common attitude toward street car riding from one of apology to one of enthusiasm, praise and patronage. Alert managers have also learned that through these progressive steps non-necessity riding may also be developed.

"The significance of the new types of equipment goes far beyond the thought of car design and lower operating costs. The very essence of this development is merchandising. In any city that seeks to meet the present day trend with modernized equipment and service, new cars can be made the backbone of nearly the whole merchandising and public relations campaigns.

From the trend of the industry toward the new day equipment and service can be traced real progress, a profound change in public sentiment toward companies showing such enterprise and toward street railway transportation.

This Is the Engine Shown Above Rebuilt Some Time in 1920.

British Engines Named

Great Britain runs to names instead of numbers as designations for its locomotives. Names are to be given the 20 1400-horsepower electric locomotives to be placed in operation on the Metropolitan Railway. The first locomotive is named "Florence Nightingale." Other names chosen are William Penn, John Hampden, John Lyon, Dick Whittington, John Milton, Michael Faraday, Oliver Cromwell, Benjamin Disraeli, Sherlock Holmes, Charles Dickens, Sir Christopher Wren, Sarah Siddons, George Romney, Sir Ralph Verney, Lord Byron, Sir Francis Drake, Edmund Burke, and John Wycliffe. Locomotives are also named after England's Kings, the largest British locomotive, which has been on exhibition in America recently, being named after the reigning King, George V.

What the Papers Say

RAIL transportation is a bigger business than that of the federal government, almost twice as big, in fact. In 1925, the government receipts were $3,780,-148,684 with expenditures of some 200 millions less, while the operating receipts of the Class I railroads totaled $6,122,500,856 and their operating expenses and taxes were slightly more than five billions.

In only one year has the government taken in as much money as did the railroads in 1925. That was in 1920 when federal receipts aggregated more than six billion 700 millions. In only four years have the government disbursements exceeded those of the railroads. In 1918 Uncle Sam spent almost nine billions, in 1919 when he was cleaning up war bills the total was more than 15 billions, in 1920 it exceeded six billions, and in 1921 it was more than 100 millions in excess of the railroads' total for 1925.—New Orleans Times Picayune.

Cutting Down the Distances

Minimizing distance is the great public service rendered by two types of railroad engineers—the one whose skill selected the best route, the other whose efficiency wins from the locomotive the best performance. Cutting down the price of distance by engineering is an accomplishment that is of lasting benefit to the country. The political method of establishing favoring freight rates merely introduces an artificial factor which cannot affect the actual costs, for whatever the pronouncement of the rate-making body, the distance the locomotive actually travels is unaffected by it. I am tempted to comment that eloquence about equalizing industrial opportunity may convince legislatures and commissions, but it does not fool the locomotive.—George Otis Smith, Director, Geological Survey.

The Wild-Eyed Communist

In no other land can there be found the equal of our national railway system. These roads contribute more toward the material advancement of the national destiny than all other combined influences and agencies. In making their own wheels go round they influence the revolution of all the other wheels of industry. Without the American railway systems Father Time would have abundant leisure to sit down and whet his scythe while pondering upon the slowness of things in general.

And yet it is no uncommon thing to hear these great institutions, their management and works, utterly damned by the wild-eyed Communist and by the featherweight philosophers who advocate a policy of government ownership of all public utilities.

But the American people will never toss their railroad systems into the maelstrom of speculative radicalism and illegitimate economies. They have learned to understand that the true ownership of these great enterprises rests in their own possession.—Cincinnati Enquirer.

'Tis Not the First Cost

One of the marvels of current railroad management is the constant reduction of the percentage of revenue that has to be taken for operation costs says the San Francisco Chronicle. One of the chief methods of bringing this about is spending more money, not less, on first costs. Among other things it seems that there are great savings in more expensive rails.

The standard rail used to be 33 feet long, 90 pounds to the yard. Now the Southern Pacific has relaid its double-track San Jose line from San Francisco as far as Redwood City with rails 39 feet long 110 pounds to the yard, and is to continue it to San Jose. The Pennsylvania Railroad, which has lines subject to abnormally heavy traffic, is now experimenting with 45-foot rails.

It is not the first cost but the upkeep that counts.

Children Should Be Seen And Not Hurt

A remarkable motor truck safety campaign, which has reduced accidents 47 per cent in six months, is being conducted in its fleet of 97 Autocar trucks by one of Philadelphia's largest department stores. Under the direction of a safety expert this store has worked along five demonstrably successful lines. The safety director, according to this campaign, should know every driver personally. Second, he should constantly make his presence felt, by every agreeable expedient aiming constantly to influence the truck drivers. Third, stickers on delivery sheets and time cards (not on the overworked pay envelopes) may be used with good effect. These stickers carry snappy sentences such as "Children Should be Seen and Not Hurt," "Famous Double Plays: Tinkers to Evers to Chance; Speed to Collision to Hospital."

Fourth, ten minute safety meetings held monthly prove valuable. Lastly, team contests, for which each man chips in a dollar arouse powerful competitive activities toward reducing accidents.

It Pays to Be Square, Says Cady

An Agent's Philosophy

By W. J. Sparks

THE agent for the Union Pacific Railroad at Laramie, Wyo., appears to be a thinker. What he says is worth the careful attention of all youngsters still floundering around in search of a worthwhile philosophy of life, and it might just as well be absorbed by a good many old timers who still have time to make a friend or two for themselves and the company before they reach the end of their run.

"I don't for a moment believe," says Agent Cady, "that there is anything short of downright square dealing and service that can keep any one out of difficulties. Both are essential, but a fact that we all have to face is that we can maintain both and still not have happy relationships with the public. We can be dealing squarely and giving service, and still if the other fellow does not recognize that we are doing it, that we are really out in his interest as well as our own, he will not be satisfied, there will be misunderstandings, and we shall have no peace.

"We have not only to give service, and to desire to give it, but we have got to illustrate the fact to the other fellow in every possible way, in all our dealings with him, large and small, and in all the dealings that it is possible for us to have with him—so that he cannot fail to recognize it.

"I do not believe any agent who has thought about it will question that this is the last big test of his work, and after almost forty years of observing other classes of Union Pacific workers at their work, I do not believe it is any different with any of them. We have all got to do our best to give service, first, and then we have got to illustrate to the other fellow in every proper way at our command that this is what we are doing.

—Herbert Photo.

Union Pacific Observation Car With 44 Windshields, Adopted Recently on That Railroad.

"If I were saying this as something useful to the company only—I would probably not be saying it. There is rather too much of a human streak in me, I guess. I say it because, so far as my experience goes, it is the only way to have any real fun. The only way I have found to get any genuine satisfaction out of life is to make other people feel that I count for something worth while with them.

"Now, practically, what does all this mean in the work of an agent?

"I remember once going, as a young man, to a station that had been in charge of a man less experienced than myself, who had not yet quite got the right idea—who still believed a little too much in difficulties. It was a small station, but there were two cars of undelivered, and apparently undeliverable, freight in it. I recall particularly a shipment of canned goods, twenty-four cases, which I was told the local grocer would not accept. I went to him immediately to find out why.

" 'There's a case missing,' he said, as if that were enough, and he added, by way of explanation, 'I'll wait forever to get my money back if I accept what's there.'

"I don't know how he had got such an idea—whether from experience, because the former agent had failed to satisfy him in some instances of the kind, or whether it was just the instinctive notion people sometimes have that a large business cannot be bothered with taking good care of small matters—when it is large, more likely than not, **because** it takes good care of them. Anyway, I looked straight at him and said:

" 'The Union Pacific is not back of any of such practice. Take the goods, and if you do not get the

missing case or the money for it in two weeks, I'll pay you myself.' And I offered to give him a written statement to that effect.

"I knew that, with proper handling, the thing would go through that way. When he saw that I was out to take care of his interests as well as the company's, and that I seemed to know what I was talking about, he accepted the goods without any written promise.

"All the accumulated goods in the freight house were cleaned out in just about the same simple way, and I had no more trouble in the short time I was there with undelivered freight.

"It is astonishing what a lot of bother just a little care in making it unmistakable that we are out to take care of the other fellow as well as ourselves can sometimes save—and how it all comes home to us in a way that makes us almost feel that we were selfish to do it.

"We had some road work going on near Laramie awhile ago, and the railroad was getting in a big crusher for the contractor. He was working on a pretty close schedule and he had 50 teams and the men to go with them, waiting for the rock crusher to arrive on a certain day. The railroad people all along the line had cooperated to get it here on time, and sure enough, on the proper morning, the car rolled in. But when we opened the car, one foot and part of one side of the great casting on which the machine sat had been broken off.

"It looked like disaster for the contractor. The crusher could not be operated as it was, and it would take a week or more to get a new casting—with the 50 teams and the men all 'eating their heads off' and the probability of delay in completing the contract.

"A little while before, it might have been impossible to do anything about the situation, short of sending for a new casting, and it seemed impossible even then, at first, but as we stood there considering what we might do, I happened to think of the new welding process—ox-welding—which I had only recently heard of, and which they had just put into service over at the roundhouse. I phoned J. W. Burnett, district foreman, and now master mechanic at Cheyenne, and asked him if this process would help us. He said he would see, and in two or three hours, he and some of his men had the casting mended so that that part of it actually laster better than the rest. I happened to see the machine a few years later.

"The incident not only brought us additional business from the contractor, but it created a special friendliness among a score or more shippers that the contractor told about it, and made our dealings with all of them more pleasant and profitable.

"Time and again, I have seen even a simpler thing than that yield results that would be as hard to measure as the ripple from a pebble cast into the sea.

"I seem never to hear the last of the handling of an overcharge claim on a shipment of household goods from back east for one of our citizens. He is a very busy man but when I called up the morning the refund voucher came in, and told him I was going to bring it right out to him—it was for $112, and he did not know before that there had been an overcharge—he would not to it, he said he was coming right down and see me instead; and that was the beginning of many pleasant dealings with others whom he told of it.

"I overheard a man complaining at the billing window just outside my office about what he knew was going to happen to his household goods when he shipped them to Los Angeles. They would be smashed, and they would take forever getting there. He knew. . .

"Well, we got them out there for him without a scratch, and so soon that he had to pay storage on them when he got there himself. He is still telling his friends about that good service.

"And the mere fact that one of our ticket clerks entered into the spirit of some local couple's plans for a holiday has often brought a generous lot of good will and more business.

"You see how it is in that sort of case. The two have been planning the holiday perhaps for years. They come down to the station in a holiday humor, free at last to do the thing they have long wanted to do, and they find the railroad, represented by the ticket man, understanding their humor, doing its best to make the most of their opportunity for them. It means something to them.

"And it means something, too, I tell you, if the clerk is gruff, and says, how should he know anything more than what there is on the board about when the train gets in —or something like that.

"One detail of the experience with the road contractor has been helpful to me a good many times since.

"There was a sand flaw in the casting that was at least partly responsible for its breaking down. Both the contractor and myself saw it as we stood looking at the casting that morning, but neither of us said anything about it at the time.

"A few days later, when the crusher was out on the job doing its work, I met the contractor, and he said:

" 'You know what I appreciated as much as anything? You saw that sand flaw and you didn't say anything about it. You didn't try to slide out. You just said, "Something must have given it quite a whack," and set about seeing what could be done to fix it.'

"That clinched a lesson for me. I've found a good many times that it's no use rubbing it in when the other fellow's case isn't any too strong. If I let him find that out himself, doing my part meantime, it works better in most instances."

Traveling At Sea in A Pullman

Florida East Coast Extension

By Walter Kennedy

IMAGINE riding in a Pullman train and being out of sight of land! No myth, dream, or weird fancy of Jules Verne could be more sensational than the 125 mile journey oversea from the southern tip of Florida to the island city of Key West. At times the traveler may fancy himself more of a navigator than a Pullman tourist, for he is almost out of the low lying keys which, covered with green shrubbery and palms, are like emeralds in the blue waters.

The Key West extension of the Florida East Coast R. R. was completed by the late Henry M. Flagler in March, 1912, at a cost of 50 million dollars. It is the only railroad of its kind in existence, and has often been called the eighth wonder of the world.

The railroad crosses deep and swift running tides as it passes over spaces of the Atlantic Ocean and the Gulf of Mexico on the way to Key West. In some places the huge viaduct passes over water that is 30 feet deep. The enormous piers in going down to bed rock often penetrate 30 feet beneath the bottom of the ocean. So enduring has been the construction of this line, and so cleverly have natural forces been employed to aid in its preservation, that it is as strong today as the day it was built.

The line has grown to realize the commercial importance prophesied for it by its indomitable builder who, amid other large enterprises in the upbuilding of Florida, started the railroad despite widespread skepticism on the part of famous engineers and railway construction experts. Today the Havana Special running over it makes the trip between New York and Key West every day in the year in 48 hours, and if the passenger is in a hurry he can take an airplane at Key West, reaching Havana in an hour and twenty-five minutes. Steamers make the trip in eight hours. Heavy fruit trains borne on car ferries from Havana to Key West pass constantly over the line during the winter carrying sugar and other tropical products to Northern markets, while much of the heavy machinery for the Cuban sugar mills goes by this route. Moreover, the line has been a big factor in the development of the entire East coast of Florida.

Surveys South of Homestead with Key West as an objective point were made in 1905. The first construction work began in April, 1905, and the line was opened to traffic as far South as Knight's Key Dock in February, 1908.

The total distance from Homestead to Key West Terminal is 128.4 miles. The longest bridge is between Knights Key and Little Duck Key, which, with approaches, is over seven miles long. Other long bridges are at Bahia Honda, where through steel trusses up to 243 feet spans are used; and at Long Key Viaduct, a structure of reinforced concrete arches. An automobile roadway, the Over Seas Highway, crossing the 125 mile stretch from Key West to the mainland is nearing completion. It too, will stand unique in road building feats for it will be the longest marine automobile drive in the world.

Bahia Hondo Bridge, Oversea Extension Florida East Coast Ry.

Carnegie and the Sleeping Car

While Andrew Carnegie was working in the office of the superintendent of the Pittsburgh division of the Pennsylvania Railroad "a very important incident in my life occurred," he wrote in his autobiography.

"One day in a train a nice, farmer-looking gentleman approached me, saying that the conductor had told him I was connected with the Pennsylvania Railroad, and he would like to show me something. He pulled from a small green bag the model of the first sleeping car. This was Mr. Woodruff, the inventor.

"Its value struck me like a flash. I

Knight's Key Bridge a Part of the Florida East Coast Railway Oversea Extension Connecting the Mainland of Florida With Key West.

asked him to come to Altoona the following week, and he did so. Mr. Scott (vice president of the P. R. R.), with his usual quickness, grasped the idea. A contract was made with Mr. Woodruff to put two trial cars on the Pennsylvania Railroad. Before leaving Altoona Mr. Woodruff came and offered me an interest in the venture, which I promptly accepted."

Borrowing money on his first note at the bank to meet the monthly payments, Mr. Carnegie eventually made his first considerable sum from this investment in the Woodruff Sleeping Car Co., later absorbed by Mr. Pullman.

Another Way to Cut Rates

The Potter Plan of pooling freight earnings in order to effect a reduction in rates on agricultural products bobbed up in the convention of the National Association of Railroad and Utilities Commissioners at Dallas, October 18. John F. Shaughnessy of Nevada, president of the association, advocated a flat 10-cent per ton charge on railroad freight traffic as a means of extending relief to agriculture and live stock, which, he said, were clearly out of balance with the industrial, financial and railroad industries. Under his plan, freight earnings would be pooled and receipts applied to a 25 per cent reduction in freight rates on cotton, grain and live stock. The proposal has not been fully worked out, he said.

Mr. Shaughnessy touched on various problems confronting railroads and utilities. On regulation, he said, "there seemingly is no justification, other than expediency, for this war plan of centralization, which has been maintained from a jurisdictional standpoint over the control and regulation of railroads. Certainly no good reason appears why the regulation of other utilities should be completely centralized at Washington."

He urged closer cooperation between state and federal commissions and said he had requested $200,000 be added to the appropriation of the Interstate Commerce Commission to defray costs of the cooperative service such as is now being considered. Mr. Shaughnessy also recommended that states adopt a uniform plan of valuation when a legal basis therefor is finally and definitely laid down by an adjudication from the United States Supreme Court.

President Atterbury of the Pennsylvania Railroad said the carriers are planning enormous programs for the future. "Investments are made with confidence," he was quoted by the Associated Press as saying to the convention. "The railroads are doing new things—they are cooperating with the air mail and air service. It is the job of the railroads to cooperate with all new enterprises.

"Never before has there been such a period of prosperity. Rail-

Florida East Coast Ferry Taking Loaded Freight Cars From the Rails of That Railroad to Cuba 90 Miles Away.

road earnings have improved and at the same time the service has been vastly improved.

"Up to ten years ago there was no regular schedule of freight moved over the Pennsylvania System. Now 90 per cent of the freight on our road runs on regular schedule, and this is true also of all railroads in the United States. The big freight trains now move on schedule, just as passenger trains.

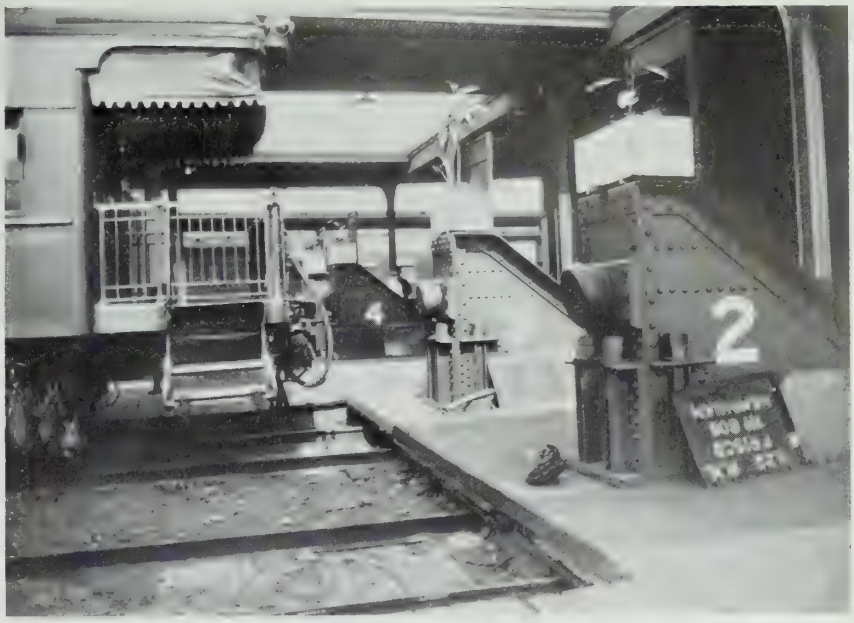
"Huge investments are responsible for this better service. We now are given proper returns on capital invested. Men are paid higher wages and last, but not least, our employes are cooperating, thus giving the best service with the least cost."

General Atterbury urged recognition and safeguarding of the independence of state railroad commissions, declaring any effort of legislative branches to restrain them should be halted. The railroads, he said, should aid the commissions. The speaker recommended seven-year terms for commissioners at adequate salaries and reappointment if they are faithful and competent.

Referring to the question of valuation, he asserted that "a fair return on our investment is our chief concern and this is purely a mathematical equation." The real question, he added, is "what are we actually able to pay on our investment." He urged protection of rail rates from unwise reductions.

J. J. Esch of the Interstate Commerce Commission declared he did not believe the advent of the automobile bus had resulted in reducing carrier revenue. The carriers profit, he said, from the automobile industry in shipments of oil and gasoline and other materials necessary to the industry.

Repeal of Section 15-A of the Transportation Act, which provides a fair return for railroads after payment of all expenses, was predicted by Senator Mayfield of Texas, who declared that this section of the act gives railroads rights to which they are not entitled under the Constitution of the United States, and works great hardships upon agricultural and other producing classes. He sought its repeal in the last congress and said he expected to see it repealed at the December session.



Flower Boxes on the Train Bumpers in the Illinois Central R.R. Station at Memphis, Tenn. Photo by Felix J. Koch Service.

Senator Mayfield said Section 15-A has led the railroads into wasteful expenditures for which the public pays. Using the railroads west of the Mississippi as an example, he said: "In 1911, 1912 and 1913, carriers in this district spent an average of $150,870,457 a year for maintenance of ways and structures. Under Sec. 15-A, Class 1 carriers alone spent, in 1923, in this district, $322,297,240 for these purposes, an increase of 113 per cent over the first named years. In many instances the carriers were practically rebuilt."

One of the more important reports submitted in the convention was on railroad rates in which a committee asserted that the Hoch-Smith resolution would withstand all attacks. The report, which was referred to a committee on reports, declares the resolution has had substantial effect in preventing rate advances and has provided the interstate Commerce Commission a convenient method for use in treatment of the rate situation.

The following officers were elected by the commissioners:

Henry G. Wells of Boston, president; Lewis E. Gettle of Madison, Wis., first vice president; Charles Webster of Des Moines, second vice president; John E. Benton of Washington, general solicitor; James B. Walker of New York, secretary, and C. S. Bailey of Washington, assistant secretary.

Rail Centers For Queretaro

A new railway center in Mexico has been announced by the National Railways of Mexico in Queretaro, where three stations are to be built immediately. These terminals will be known as Empalme de Escobedo, Huichapan and San Juan del Rio.

Queretaro is a dead city at present, speaking of business, but the added employment to be provided by making it a railroad terminal is expected to improve conditions. It is estimated that 250,000 pesos will be spent in repairing old buildings in addition to the new program.

—Herbert Photos.

A Shower Bath for Coaches on a German Railway Saves Time and Much Money.

An Idea From Germany

German railways have just put into service at Berlin a shower bath for train equipment that seems to be saving money for the company, which continues to be the purpose over there. The train to be cleaned passes through the shed shown in the illustration, and as it passes it is sprayed with water. As it moves the wet surface is rubbed dry and polished by the revolving chamois on the rotating racks which, in the picture at least, resemble bunches of bananas. The complete process, it is reported, takes less than five minutes for a car.

In the Pacific Electric Shops at Torrance, Cal., Safety is a First Consideration.

The P. E. Shops at Torrance

The shops of the Pacific Electric Ry., at Torrance, a suburb of Los Angeles, are said to be in most ways the ideal of electric railway men everywhere. They cover 125 acres, require a force of 1250 workers, the equipment throughout is the last word in efficiency and safety. Glass roofs and expansive windows insure a maximum of light and further contribute to safety and efficiency of workers.

The need of the expansive Torrance shops is evidenced by the tremendous volume of equipment operated by the Pacific Electric, known as the world's largest electric interurban railway system. Employed in its regular service are 790 passenger cars, 2773 freight cars, 54 electric locomotives, 28 express cars and 203 motor coaches. The total value of equipment is about $15,000,000.

—Herbert Photos

Canadian National's Fire Fighting Equipment for Densely Timbered Regions.

The Torrance shops and their operations are supervised by S. H. Anderson, superintendent of power and equipment. F. E. Geibel, assistant superintendent of equipment, and Edward Straub, general foreman, are actively in charge of its operations.

It Pays to Think

Ideas are like matches. They're useless unless you strike them into flame. If you think some scheme of yours would make a saving in time, work or expense, don't be afraid to go to the man higher up with it. It won't do you or him or the company any good while you keep it to yourself.

Don't be afraid to spring a new idea on the boss. He's after good ones every day. A good idea for him is worth a better job for you.

The trouble with most chaps is that they keep their noses too close to the grindstone. They are too content to do their work like a machine without ever thinking how to improve it, and in many cases when they have a good idea they don't have "pep" enough to try to put it across.

A machine can do most any work a man can do nowadays, but a machine can never think.—Exchange.

The satisfaction of having done your best is next to the satisfaction of having succeeded.

Have patience with a friend rather than lose him forever.

We need not worry what man descended from; it's what he descends to that shames the human race.

In the Shops at Torrance, First Class Machinery Produces First Class Work.

This School Goes to the Children

By

W. J. Fanning

WHEN the department of education in Ontario discovered that children in homes far from school facilities were growing up uneducated the officials decided something had to be done about it. As usual the railroads were called upon, and as usual they responded promptly and cheerfully.

After months of thought and planning and after a thorough survey had been made of the Northern settlements the department of education, working under the direction of Premier G. Howard Ferguson, as minister of education, has evolved a plan which will take educational facilities to the children throughout Northern Ontario. To meet the peculiar requirements of these communities, traveling schools have been introduced. Both the Canadian National and Canadian Pacific Railways were requested to cooperate in making the plan a success and they gladly and promptly did so. Under the direction of the railways two coaches were converted into a school room and living quarters for the teachers combined and the department supplied all equipment and the teachers. In every way the educational facilities offered to the children will be the equal of that afforded by the highest type of rural school. By this unique method of instruction, every child, no matter how small the place wherein he lives, should be in the position eventually of obtaining all the educational advantages open to children in the more settled districts of Ontario south of him.

As in the case of all innovations, the experiment opened in a moderate way. For a beginning only two cars have been constructed, one by each railway.

It is hoped that each car will stop at about six communities during the month, making brief visits of three to six days. During this time the children will spend a large percentage of their day in school, and upon leaving, the teacher will give them sufficient homework to assure an unbroken continuance of their studies until the car returns again in the course of about a month or five weeks. The various teachers have all been specially selected for their knowledge of the North and its requirements.

At the inspection of the cars by the press, Dr. J. B. McDougall, chief inspector of the education department for the traveling schools, pointed out that a survey showed that on the two subdivisions on which the cars will operate there were approximately 85 children who never have had any schooling, except those whose parents were in a position to send them to boarding schools.

"There are at present," Dr. McDougall said, "between 300 or 400 other children stretched along the 3,000 miles of steel which goes to make up the railway mileage in the Northland who also suffer from a similar disadvantage. It is the aim of the department to see that these children secure a good, sound education, and it is with this end in view that the experiment is being made."

Both cars are very much the same in construction. Approximately one half is devoted to the school room proper. A dozen desks of the usual school type, grading from those for larger pupils down to the smaller ones in the first book, have been installed, while at the so-called front of the room stands the teacher's desk with a blackboard behind. A second large blackboard runs three-quarter way along one side of the car. Besides the ordinary school equipment, including a regulation bell to summon the scholars, there are two bookcases, one containing the usual school books and the other a small lending library, including standard works for the

adults, as well as for juvenile reading. Behind the school room is the bedroom of the teacher and in the rear of this again comes a kitchen equipped with everything from stove to ice-box.

The car library is made up of a few works of reference, a fair number of works on subjects of general interest, and several works of new and standard fiction, with Canadian authors predominating. These are for adults and form less than a third of the collection. There is a goodly number of exceptionally good editions of books for older boys and girls, consisting of the best type of stories, and works of a miscellaneous character which represent subjects in which young people have a natural interest.

Dr. McDougall said that to the children the novel school room was a revelation. Their bulging eyes, intent upon the teacher, and glistening with satisfaction, testified eloquently that they realized to the full extent what an opportunity had been opened to them. In all his experience, he said, he had never seen such attentive and willing classes.

How Railways Help Industries

Under average conditions the job of getting a site for a manufacturing plant is a discouraging one. At the first rumor realty prices go up instantly, as they do when a new union station is contemplated, so that inevitably industrial concerns' managers are forced to match greed with secrecy. Until comparatively recent years the task of getting a spur track from the main line to the site, after it had been found, was almost as difficult, and still is for that matter in many parts of the country. Railroad traffic agents did not realize that a business turning out only a car load or two a week in the beginning might grow into a very important volume in time.

It is a well known fact that many industries have been lost to towns that needed them through the greed of property owners and the shortsightedness of railroad traffic managers. The extreme importance of this one feature of railroading was seldom better illustrated than in the case of St. Joseph, Mo. There are five railroads in that little town, a great jobbing center. The smallest of the group, the Chicago Great Western, needing all the business it could get to keep alive, made every possible and proper effort to encourage manufacturers and jobbers to locate along its lines. Today it has, in St. Joseph, more than 60 industries alongside its tracks, or on spurs. When a company wanted a building site the railroad helped to find it at a reasonable cost and then provided a spur.

In much the same way the Southern Pacific has gone about the business of encouraging manufacturing and jobbing. Industrial agents were placed as a subdivision of its traffic department in San Francisco, Los Angeles, and Portland, Ore. These agencies have been equipped with the necessary machinery to obtain authentic data as to the availability and development of raw materials along the Southern Pacific lines, the location and valuation of property to be had for industrial sites, the cost of power and water, and other data that are essential to the manufacturer. Engineering service for the proper construction of industrial tracks is supplied and advice is given as to the best methods to serve any certain property. In order to reduce the cost of construction of these spur tracks and make available desirable industrial property the company has built service tracks into the large areas of industrial properties in various locations along its lines, thus assuring immediate service without undue cost, and at the same time developing property which can be bought at prices within reason. In most cases when building these tracks the railroad has insisted that a definite price be placed on the properties. In this way the Southern Pacific really invites prospective industrialists or firms needing information to communicate with its agents in Pacific Coast towns, or through the various agencies the company maintains throughout the United States.

Of course, this service is not peculiar to the Southern Pacific. The other great transcontinental lines are equally energetic so that, in the western half of the country, at all events, business men have little cause for complaint or discouragement in finding suitable places for investment. It has been pretty well established that the best factory sites can be obtained and at the most reasonable prices through the industrial agencies of the western railroads.

Fine Examples of Efficiency

Addressing the Westinghouse Club at Pittsburgh, recently, Walter D. Hall, superintendent of the St. Clair Tunnel electrification of the Canadian National Rys., reviewed the operation of the electric locomotives which in 19 years of operation have run more than three million miles and in their nineteenth year were available 97.7 per cent of the time. The average maintenance per locomotive mile over the period of 19 years has been only 9.45 cents. Last year this cost was 6.21 cents.

Think!

Study alone is not enough; the ambitious man must think. If he is not succeeding, he takes account of himself and, by thinking, tries to find out what he can do to become successful, to get ahead. He analyzes his own situation; he tries to find out what is wrong; he seeks advice, but he depends upon himself and his own thinking. He can help himself in a way that no one else can help him.—Judge E. H. Gary.

Recollections of An Old Railroader

First Ride on the "Q"

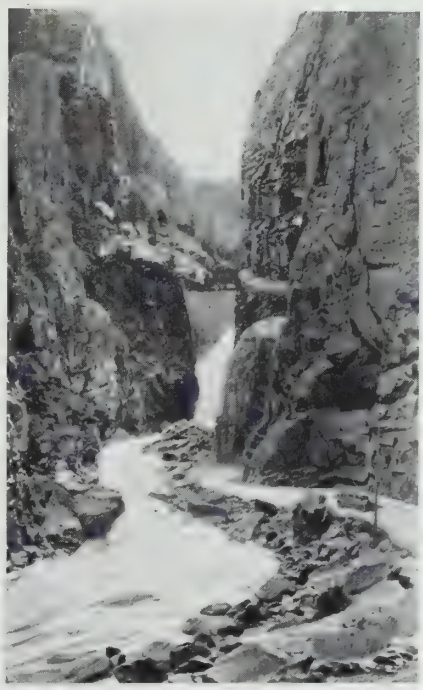
By C. P. Philbrick

Train Rules Examiner, C. B. & Q. Retired

MY FIRST ride over the Chicago, Burlington & Quincy, enroute from Boston to bleeding Kansas, began November 7, 1860, leaving Chicago at 7:15 a.m., on train No. 1. Before we were due to leave, I wandered over to the head end of the train and found we were to be pulled by an engine named "Antelope," an inside connected machine built by the Amoskeag Works; drivers 6 feet in diameter, cylinders 16 by 20 inches, weight 26 tons, and resplendent with ornamental brass-work.

The engineman and fireman were having an animated discussion relative to a tallowpot which, in those days, was used by the fireman when he went out over the runningboard to oil the valves while the engine was moving, not working steam. This utensil, I gathered from the conversation between the two men, had been sent to a tinker to have a leak soldered. But the preceding day having been election day, the "tink" probably had forgotten to remedy the defect, and melted tallow was seeping from the leaky seam, and the two grievers were expressing concurrent opinions of the negligent mechanic. Suddenly the cry of "a-a-all-aboard" sounded and I hastened back to the car I was to occupy.

It was a wet, chilly morning, heavy rain having fallen the night before, and after getting out of the city, our progress was quite jogglesome over low joints and high centers. It seemed to me we were passing through a region of utter desolation, so different from that I had been used to seeing in old Massachusetts, plentiful farm houses, red barns, orchards and sparkling brooks; something pleasing to the eyes all the time, and as a boy nine years old, I began to feel homesick.



Shoshone Canyon, Cody Road to Yellowstone Park, Burlington Route.

My despondent feelings were somewhat allayed, however, when the conductor appeared at the forward end of the car and shouted: "Tickets please!" His request rang out in a clear, mellow tone and his round face carried a jolly expression. No prescribed uniform was then worn by conductors, each man costuming to suit himself. As I recall, this gentleman wore a dark blue coat, tight fitting light-colored trousers strapped down to his boots, a red double breasted vest with large, white buttons and a profusely ruffled white shirt bosom. Surmounting this was a collar with high points well up on the sides of his face, and a bright yellow neck cloth wound probably two or three times around his neck and tied with a large double bow-knot. He wore a round topped black cap surmounted by a large round button, with a visor that came down over his eyes, and a gold badge with the word "Conductor" in black letters. I was much impressed by his brilliant, colorful appearance and mentally resolved to become a railroad conductor when I could qualify for so high a position. Still I could not help thinking that if he would cover his face with burnt cork, he would bear a striking resemblance to Johnny Pell, a popular end-man of Christie's Negro Minstrels of that day.

But he was polite and attentive to his passengers, especially the ladies. He seemed to know many of them by name. Some of the younger he addressed by their given names. One young lady whom he addressed as Molly, curtly responded: "Thank you sir, but my name is not Molly." Not in the least abashed he quickly responded, "Oh! well it ought to be; my wife's name is Molly, and you look a heap like her," and the young lady giggled and passed up her ticket, the near-by lady passengers joining in the mirth.

Many of the male passengers addressed him as "Sandy." Every time he passed through the car he seemed to be making the passengers feel happy by his waggish remarks. Added to this happy faculty, he was always on the alert to see that his passengers were properly accommodated.

The election, the previous day, of Abraham Lincoln was the main topic of interest. At every station

crowds were assembled on the platforms cheering and shouting, wet and muddy but enthusiastic. Men with big horns were shouting through them: "Hurrah for Old Abe the Ra-a-a-il-splitter!" Women and children united with their shrill voices. At one station a big mule, hitched to a post, jumped around, splashing the mud everywhere and giving vent to a noise that sounded like a big "hu-r-r-a-ah!" Men who appeared to be quite damp, internally, as well as externally, would tumble off at the stations, and others equally damp would tumble on, all happy and good natured, and all striving to shout the loudest for Illinois' favorite son. Brass bands would board the train and ride a few stations, playing fiercely in the flat topped cars. Conductor Sandy would have a funny time digging his way among bass and snare drums, tubas and trombones, climbing over the extended legs of saturated enthusiasts who were about all in excepting as to lung power; but Sandy seemed to enjoy it all. A spindle-shanked train-butcher who kept up an incessant yelling about "S-e-egars," "peanuts," "fig-pa-a-iste" and other refreshments, would join at intervals in shouting for the rail-splitter. Once, a couple of men well moistened who sat in a seat together, were half dozing when the brakeman, after executing cadenzas on a couple of brakewheels, stuck his head in at the half opened door, and shouted "Ya-a-bee-gabby!" or some such noise, whereupon the two men arose and one asked the other: "What place did he say this is, Bill?" The other solemnly and truthfully responded: "Dam'f anybody knows; let's get off anyhow," and off they tumbled, shouting the praises of Abraham.

And so on we went, chunckety plunk; music, cheers and railsplitting declarations until we reached Galesburg at 5:20 p. m., "right on the dot," Conductor Sandy informed us. No train was due to leave for Quincy until the following morning at 8:36, so we remained at Galesburg over night, and attended an enthusiastic meeting on the grounds of Knox College where speakers addressed the assemblage, standing on the spot from which Mr. Lincoln had previously delivered his famous "Galesburg Speech." The excitement during the day had entirely overcome my mental low temperature, and I was rapidly becoming acclimated. My recollection is that Galesburg did not retire at all that night.

We continued our journey the following morning expecting to reach Quincy at 12:55 p. m. but did not arrive there until after 6:00 p. m., having been delayed by an opposing train that had been wandering about on the right of way, but not on the track where it properly belonged. Trains were not then moved by telegraph on the "Q." The rules provided that what we now term the superior train, would wait at a schedule meeting point five minutes for the inferior train and then proceed, leaving all stations thereafter at least five minutes late until the delayed train would be met. Then, "Should both trains get more than 25 minutes behind their card time at places of meeting, they will look out for each other, proceeding cautiously, and avoid the possibility of collision." Other railroads prescribed similarly, adding the provision that whenever opposing trains met between stations, the train nearest a station must back up and permit the other train to proceed. Another very cautious railroad required down trains to watch carefully for the smoke of delayed up trains and avoid collision. I never found any ancient rule of the "Q" authorizing railroading by smoke, but regular trains not plumb on time were admonished to move cautiously between specified points, and expect to find another train opposing them.

While we were waiting at Camp Point, a man rode in on a horse from the west, and brought news of the derailed train and our engine was taken to its assistance. We remained at Quincy that night, and the following morning, ferried across the Mississippi River, and continued our journey, on the Hannibal & St. Joseph R. R., reaching St. Joseph, Missouri, about 10:00 p. m. During our ride of 200 miles and more that day, we had heard no rejoicing over the election.

The railway transportation was finished on the Platte County R. R. now a part of the St. Joseph division of the Burlington, to Winthrop where we ferried across the Missouri to Atchison, then traveled six miles in a hack to Doniphan, and there transferred to a large vehicle drawn by four sturdy oxen that dragged us on to the end of our journey.

They Smoke Much in London

The following notice recently circulated by the London Underground Co. is eloquent of surrender: "In view of the increasing number of smokers (and women having taken to smoking) the Underground Co. feels the time has come to extend still further the concession recently made in regards to lifts, and provide some extra accommodations for smokers in the underground cars. Sixty per cent of the cars, today, are smoking cars and this is to be increased to 70 per cent. . . . Every carriage will be open to smokers, except those which are marked with a special symbol embodying the words 'No Smoking.' This symbol will comprise a blue star superimposed on a green disc and will be exhibited on the windows of non-smoking cars. The 'Smoking' notices now exhibited on the car windows will be withdrawn."

"The best angle from which to approach any problem is the try-angle."

"Life is a quarry out of which we are to chisel and complete a perfect character."—Longfellow.

The Reasons for Roller Bearings

Doing Away With Friction

By Walter C. Sanders

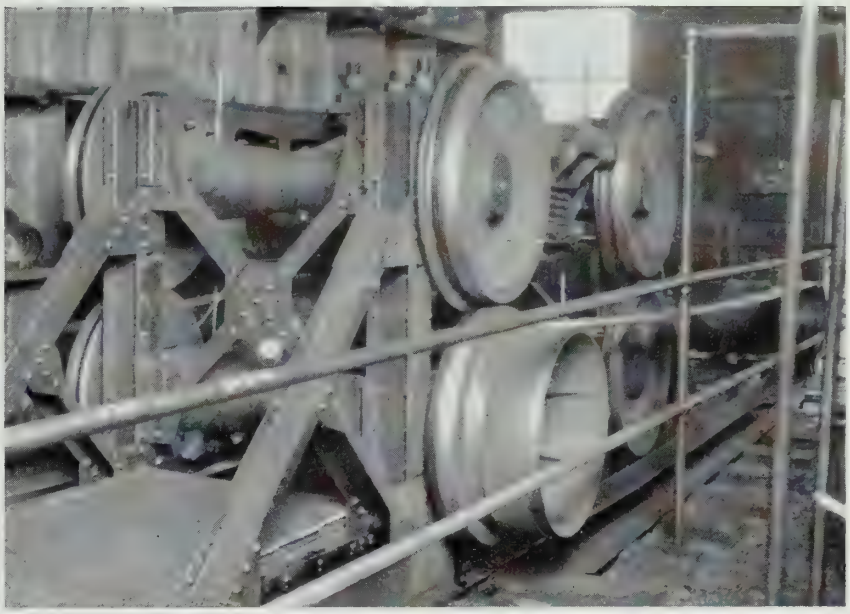
THE passing of the extraordinary era of extensive and hurried railway construction makes the problem of the hour confronting railroad men one of economy in operation and greater durability and efficiency in the many devices and parts which go to make up the rolling stock of a railroad. The use of roller bearings on railway cars is a question receiving a great deal of attention at this time when refinements in engineering and perfection of equipment are dominant thoughts in the minds of progressive railroad men.

Many attempts have been made during recent years to solve for railways the problem of anti-friction journal bearings. Failures have ordinarily resulted from one or more of three causes:

First: The crushing strains under heavy loads and blows upon the surfaces of the metals in rotating members and raceways resulted in fatigue and fractures; second, the diagonal twisting and jamming of rollers; and third, the troublesome end thrust which may at times equal 40 per cent of the vertical load.

For the heavy combined vertical and thrust loads at high speeds, the tapered roller bearing principle seems essential to durability. Not only should the bearing perform the dual duty of taking radial and thrust loads, but in a railway roller bearing there must be no delicate, breakable, or complicated parts involving expensive renewals.

The principal object of the tapered construction is to provide capacity in the bearing for the thrust loads, which exist in all railroad applications, with no appreciable sacrifice in vertical load carrying power. By reason of the fact that only the top rolls in the bearing carry vertical load, while all the rolls are effective under thrust load, the bearing has a thrust capacity almost equal to its vertical capacity. In other words, with an increase of 2 per cent in the normal load on the rolls under vertical loading a thrust capacity equal to the vertical capacity is obtained. By varying the included cup angle the ratio of thrust to vertical or radial capacity can be changed over wide limits.



Method of Testing Inboard Type Trucks in Laboratory. Full Axle Load Is Applied and Trucks Operated Continuously.

Another advantage of the tapered construction has proved, however, to be quite as important as the provision for thrust loading. Operation of a roller bearing, particularly at the higher speeds, requires correct alignment of the rollers with respect to the axis of the bearing. If the rollers are not accurately aligned, contact with the races over their entire lengths will not be obtained and dangerous concentration of stresses on small areas will result.

The tapered roller bearing is practically frictionless, the rolling resistance being less than three-tenths of one per cent.

It is an indisputable engineering principle that, whenever two moving parts are in contact, wear must eventually occur. No matter how well the parts of any type of bearing are made, the constant motion, sooner or later must result in wear.

The tapered roller bearing can be satisfactorily adjusted for the small amount of wear which may eventually occur. This adjustment feature also provides wider tolerances for machine work on axles and bearing boxes.

The adjustment consists of moving the tapered outer race-way or cup a little farther onto the tapered roller assembly. The whole bearing will then function like new and replacement is eliminated.

Until recently there has been a general tendency to under-rate the

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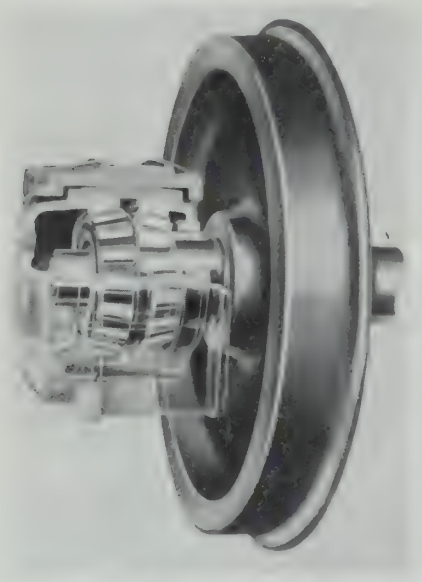
Abstract of a paper presented at a meeting of the American Society of Mechanical Engineers in Seattle, Washington, by Walter C. Sanders, general manager, railway division, Timken Roller Bearing Co., Canton, Ohio.



X-Ray View of Tapered Roller Bearing Application for Passenger Equipment.

retarding effect of journal friction and the power required to overcome friction in railway operation. It has been conclusively shown that the practical elimination of friction by roller bearings means a saving in power costs, and it is now becoming apparent that the weight of cars should not rest upon a sliding surface which will retard the rotation of the journal. Relatively, it is as important that the bearings should roll, as it is that the wheels should roll.

The energy consumed in hauling a train depends, of course, on the total resistance. This is composed of several factors such as journal friction, rail resistance, air resistance, grade and curve resistance, and that form of resistance which is caused by vibration or oscillation, all of which may vary considerably under different conditions of track, speed, weather, and train combinations.

The component parts of train resistance can be divided into two groups, namely:

(a) Resistances which will vary directly with the speed, comprising journal friction, rolling friction, flange action and track resistance.

(b) Resistances which increase with the square of speed, namely, all forms of air resistance.

The reaction between wheel and rail may be grouped under two heads, vertical and lateral. In the former category are rolling friction, track resistance, and impact at points. Lateral resistance is caused chiefly by what is called flange action and varies with the speed and cross winds.

When determining the reduction of resistance due to the use of roller bearings, it is usual to compare the total resistance of a train with plain bearings and one with roller bearings under similar conditions of train weight and speed, and the saving is usually expressed in percentage of the total energy consumed.

It is evident, however, that the roller bearing can only claim the saving effected in journal friction and less weight per truck and that the variation in resistance caused by any of the other factors has no bearing on the question. Tests have indicated that at all speeds below 36.5 miles per hour the resistance due to plain bearings is considerably in excess of that of roller bearings.

Considering the resistance caused by the journal friction on a railroad car with plain bearings, we can distinguish three different periods as follows:

1. Starting period.
2. Heating period.
3. Period of constant temperature.

The starting resistance is of importance, especially on roads with low grades, as it is the deciding factor in determining the size, weight and rating of the locomotive.

Mechanical friction constitutes a large element of train resistance and journal friction is so large a part of mechanical friction that all other elements of mechanical friction may be subordinated to it. Journal friction imposes a dead weight that must be overcome every time a wheel turns.

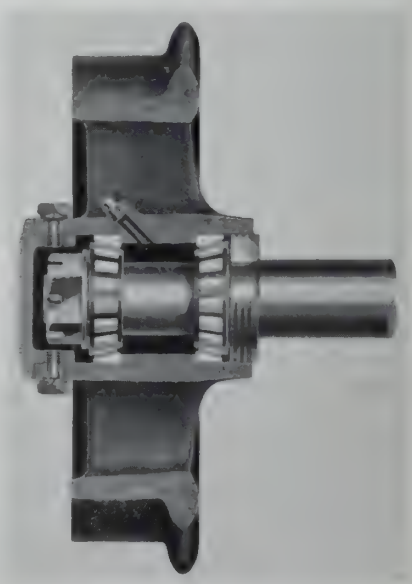
Tapered roller bearings were brought to their present stage of development only after a long and painstaking series of tests, both laboratory and service, which extended over a period of several years. During that time a number of different classes of rolling stock, including gas-mechanical cars, gas-electric cars, freight and passenger cars and locomotive tenders were equipped and put in test service on various railways.

The first of these tests was conducted to obtain data on the comparative starting, acceleration, running and coasting of two standard railway freight cars, one equipped with tapered roller bearings and the other with plain bearings. The two cars were of the same series and identical in every respect with the exception of bearings. The roller bearing car had made 22,100 miles in main line service, and the other was selected at random from among the cars used by the same railroad. The cars were loaded to capacity with steel billets. The following table gives the weights, light and loaded, that existed throughout the tests:

	Roller Bearing Car Lb.	Plain Bearing Car Lb.
Stenciled capacity	80,000	80,000
Weight unloaded	43,200	40,401
Load (steel billets).....	78,715	80,760
Total weight (car and load)	121,915	121,160

The test showed that the ratio of the starting resistance of the two cars was 8.8 to 1 in favor of the roller bearing equipped car, or a saving in tractive effort at starting of 88.8 per cent.

The starting test was conducted by attaching one end of 3000 lb.



Applications of Tapered Roller Bearings to Hubs of Flanged Wheels.

capacity dynamometer to the car and the other end to a block and tackle. Force was slowly applied to the block and tackle until the car started, at which instant the dynamometer reading was taken. A total of fifty-six readings in both directions were taken, at 30 second intervals. An average of the readings shows the following results:

Roller bearing car—4.38 lb. per ton or 267 lb. total to start.

Plain bearing car—38.59 lb. per ton or 2337 lb. total to start.

Ratio—8.8 to 1 in favor of roller bearing car.

Test Application of 70-Ton Inboard Type Truck Under Freight Locomotive Tender.

In the acceleration test each car in turn was hauled by a 300 h.p. plain bearing electric baggage car for a run of 20 seconds. Readings were taken as soon as the car started, and every five seconds thereafter. The average of results shows the acceleration in miles per hour per second for 15 seconds to be 0.69 for the roller bearing car, and 0.57 for the plain bearing car. Speed after 20 seconds was 10.54 m.p.h. for the roller bearing car and 8.75 m.p.h. for the plain bearing car. As to total distance traveled in 20 seconds that of the roller bearing car was 144.94 feet and of the plain bearing car 122.23 feet. The direct power saving during the run ranged from 28 per cent for the first 5 seconds to 18 per cent in 20 seconds.

The running test was made to determine the actual saving in power consumption of the roller bearing car. The test run was made over a stretch of track 28.30 miles long which included varied conditions of gradient and road bed. The cars were hauled by a 300 h.p. plain bearing electric baggage car and readings were taken every 15 seconds. The net results indicated a power saving of 17.4 per cent in favor of the roller bearing car.

The coasting test was conducted upon track which was in very poor condition and had numerous right and left and up and down grades. The down grade at the starting point was 0.25 per cent.

The roller bearing car started without assistance when the brakes were released while it was necessary to bump the plain bearing car three times with a locomotive before it would start. The roller bearing car coasted a distance of 7,200 ft. while the plain bearing car coasted 1,300 ft.

Another test which may be cited is of considerable interest, partly because of the results obtained in the matter of power consumption, and partly because of the light thrown on the effect of journal friction on train resistance. These tests were conducted with two gas-electric trains in revenue service operating over a stretch of over 200 miles, one being equipped with roller bearings and the other with plain. The two trains were made up of cars as nearly identical in weight as possible, the actual totals being 172,360 lb. for the roller bearing and 169,780 lb. for the plain bearing train. The track on which the tests were run shows an average up grade in one direction of 0.056 per cent for one section, and 0.081 per cent for the other. The rail section was heavy and there was a high proportion of tangent track. Track maintenance and ballast were both good.

In the revenue service test graphic records were made of traction motor voltage and car speed, and the energy input to the motors. On some grades the graphic meter records were checked by 10 second readings on indicating meters. As a further check an accurate record was kept of the time of each power application and cut-off of each brake application, and of the duration of every stop.

A total of twenty-six tests were made and, without going into detail, it was found that, without considering corrections for windage, or different track conditions the overall power saving of the roller bearing train amounted to over 9 per cent on a gross ton mile basis.

An item of maintenance where roller bearings will effect a considerable saving is that of hot boxes. The frequency of hot boxes or the number per 1000 car-miles will vary considerably on different roads, due to the different conditions of operation. The cost to the road per hot box will also vary somewhat. One road has estimated that in passenger service a hot box costs approximately $30, which would indicate that a road operating several thousand passenger cars must have a large hot box expense. The use of roller bearings will almost completely eliminate the troublesome hot box situation with all its attendant ills effecting thereby a considerable saving to the road.

A check-up on the grease used in the bearings on the Milwaukee road's "Pioneer Limited" train, running between Chicago and St. Paul-Minneapolis for the month of July, 1927, disclosed that the cost of lubricant is much less for roller bearings than for plain bearings. The previous cost to lubricate the train on plain bearings averaged

Sixty Ton Oil-Electric Locomotive on Tapered Roller Bearings.

22.5 to 26 cents per 1,000 car-miles. The cost of grease for the roller bearings on this train for July, 1927, averaged 15.8 cents per 1,000 car-miles.

The Timken Roller Bearing Co. has in successful operation a number of 50-ton and 70-ton freight cars embodying an entirely new type of inboard trucks. It is believed that this type of truck can ultimately be built by the car builders and railroads including the roller bearings at a cost not greatly exceeding that of the existing type of freight truck. An inboard truck is one having the bearings mounted in a housing on the axle inside the wheels, there being no journal boxes and bearings outside the wheels. The freight cars equipped with this type of inboard trucks weigh appreciably less than the plain bearing freight cars, thus effecting a power saving because of their lighter weight as well as through the use of roller bearings.

Standard A. R. A. Truck Showing the Overhang Eliminated in the Inboard Type.

The desirable features of the design of the inboard truck are, first, a marked saving in weight due to the reduction in length and diameter of the axle and a reduction in length and cross section of the bolster and spring plank, and, second, simplicity of design.

The inboard type truck is still in the experimental and development stage, although the tests have progressed far enough and the results obtained have indicated that this type of design is very feasible.

The adoption of roller bearings for freight train cars, regardless of the design of truck, faces the difficult problem of interchange. However, so great are the potential savings, that there can be no question about finding a way to solve the interchange problem.

Because of their capacity for taking thrust loads, tapered roller bearings have been very successful in the wheel hubs of mine and industrial cars; and studies are now being made of their application to the hubs of railway car wheels.

A gasoline coach with tapered bearings in the hubs of the wheels of one truck is now in operation. The light weight of the car is 42,960 lb. and it has a seating capacity of 52 passengers. The application is similar to that shown in Fig. 18 which illustrates the standard mine car application made by the company with which the author is associated. There are over 82,000 mine and industrial cars in service on this type of mounting, a great many of which have already been operating for over six years. A few cars now under test have already operated for 20 months on 5 lb. of grease. The principal advantage of the wheel mounting shown is that each wheel on the axle rotates independently of the other and no wheel slippage is necessary on curved track. This reduces the flange wear to a considerable extent. The adjustment is made on the cone by means of a nut on the end of the axle. The tapered design of the bearing takes the end thrust as well as the vertical load.

In the first half of 1927 in the United States, 15 pilots and 28 passengers suffered fatalities in 25 airplane accidents. These accidents occurred in course of taxi and pleasure rides, test flights and instruction.

Railroading and golfing have one thing in common, if par is made. You've got to "hit the ball."

This Is the Roller Bearing Truck. Compare It With the One at the Left.

C. A. Coffin Prize Awarded

The Charles A. Coffin prize was awarded October 4 to the Grand Rapids Ry. Co., for increasing its gross business 20 per cent last year and for its pioneer work in improving transportation facilities. The prize was awarded formally at the annual convention of the American Electric Railway Association in Cleveland. The award, consisting of a gold medal and $1,000 for the employes' benefit organization, is awarded annually by a committee of the association to an outstanding electric railway. It was established by the General Electric Co. in honor of the late Charles A. Coffin.

In the last three years the winning company has rehabilitated its rolling stock, financial set-up, relations with public and employes, and salesmanship methods. Announcement of its revolutionary plans caused a sensation at the A.E.R.A. convention in 1924; today the plans are being followed by scores of companies throughout the country. B. C. Cobb of Hodenpyl, Hardy and Company, New York, is president of the company, and L. J. De Lamarter of Grand Rapids is vice president and general manager.

First the company demanded from trolley car manufacturers a new car of lighter design, upholstered and painted after the manner of motor cars, and made as nearly noiseless as possible. Three cars of this design were placed in service, and the company held a voting contest for the public to decide which type of car it preferred. When the choice was made, old cars were supplanted with the new ones and the old cars were burned at a public bonfire. The mayor applied the torch in the presence of 50,000 car riders.

The company's announced intention of revolutionizing its business methods, including relations with public and employes, has been carried out in full. Capitalization of $2,226,000 and annual fixed charges of $90,000 have been written off. Stockholders relinquished all claims to back dividends of eight years. Employes are told in detail the facts about the financial situation, are invited to sit in conferences with department heads, and are paid for suggestions leading to improved service. They are schooled in salesmanship and courtesy, and are made to feel that they are active participants in the business life of the community.

The public quickly responded to the new order of things. When application was made to extend the line, the city commission refused to grant permission until it determined that the company would be able to make an adequate return on its investment. The mayor announced that, if necessary, he would work for a subsidy for the company. An application for paving cost relief had the indorsement of the local taxicab company. Stores readily agreed to act as sales agents for railway tickets. Motormen and truck drivers were brought into close contact, and friendly relations were established. Company employes began to take an active part in civic movements.

Descendants of pioneer citizens assented readily to having cars named after their ancestors. Cars were painted in bright colors and decorated with the insignia of local organizations such as the high school and boy scouts. When Lindbergh visited Grand Rapids, a car was named for him and decorated with paintings of the United States flag and airplanes.

A Kiddies' Day at the railway park brought out 30,000. Twenty thousand persons gathered in the business section to learn the results of a voting contest for names of new cars. Every newcomer to Grand Rapids receives a letter of welcome from the head of the street railway company.

Agitating accident prevention, the company set an example by reducing its own accidents by 22 per cent last year. Free uniforms are given to employes who have clear accident records. At the time the contest closed, only two claims for accidents were pending against the company.

"Whistling Away Friends"

The rules of the standard code are now in general use on all railways of the United States and Canada. This code provides 15 standard engine and motor whistle signals, in addition to which, many railways add a few more. Standard rule 31 commands: "The whistle must be sounded at all places where required by rule or law."

State laws provide the whistle must be sounded at a specified distance from all highway crossings, by the enginemen of engines approaching such crossings. The code provides a standard signal of two long, followed by two short blasts of the whistle, which has later been changed to "two long, one short, followed by one long blast," some railways requiring that the last long blast be sounded continuously until the engine has covered the crossing. This signal, with the one long blast to be sounded approaching stations, junctions, railroad crossings at grade, and other prescribed points comprise the signals that must be regularly sounded by the engineman during his run, the other 13 signals covering emergency conditions that may or may not be present.

To comply with these requirements, I have record where, by actual count, while riding an engine on a 124-mile passenger run, the engineman had to pull his whistle lever 1,110 times in five hours; 222 pulls every hour or 37 times every ten minutes. Accepting the suggested cost of 25 cents a "toot" in your editorial last month, he had "tooted" away $277.50 during the run. With at least 100 such runs on that railway, we see that $27,750 was spent daily for "toots" and the annual cost of "toots" overruns

considerably the million dollar mark.

The engineman with whom I rode to make the observations mentioned, did not in any instance whistle unnecessarily, but only at points prescribed by rule or law, and then "with intensity and duration proportionate to the distance signal is to be conveyed." (See Rule 14.) He is one of a large number of good men that are honestly striving to observe the command: "Safety is of the first importance in the discharge of duty. Obedience to the rules is essential to safety." But yet, he has recently been made party to a suit brought against his employing railway for colliding with a vehicle at a highway crossing in which it is alleged that he did not sound his whistle as required by law. I will offer the suggestion that at that moment, an irascible old-timer who "lives in a house by the side of the road" near that crossing, was cussing because that engineman used his whistle so loudly and so long at the crossing.

And so we have it both ways; according to the old railroader's song, "It's damned if you do and damned if you don't, so Jerry go ile the c'yar."

During a term of 17 years as a supervisor and instructor of rules observance on that railway system, I often was obliged to admonish enginemen who failed to "toot" their engine whistles as prescribed by rule or law, but never to criticise one who "tooted" too often, too loudly or too long. During an earlier period of railroading, some engineers liked to play with the whistle. At the present time, he who expends the necessary amount of physical exertion to obey rule or law and pull his whistle lever at the rate of 37 times every ten minutes, does not care to indulge in any noisy, unnecessary whistling.

That lachrymose effusion from the monthly bulletin of the Southern Pacific I am certain is not the thought of my friend Bill Nichols, chairman of examiners, who spends his time mostly traveling over the system talking to men relative to strict observance of rules, and I have never sat in one of his seances and heard him urge enginemen to avoid whistling so loudly that any nearby angry daddy "wearing a path in the carpet" may be annoyed.

Considering the subject seriously, however, I think that the amount of whistling required by rule or law, generally is a worthless nuisance that should be discarded just as we discarded links and pins.

Any state legislature that would enact a law prohibiting the sounding of a locomotive whistle within its borders would be acting wisely, and conducing to "Safety First."

C. P. Philbrick

Downing, Cal.

King George on the B & O

Running smoothly and pulling a train of seven cars, the "King George V" fast passenger locomotive of the Great Western Railway of England, brought to this country for participation in the Baltimore & Ohio centenary exhibition and pageant, made successful runs October 17 between Washington, Baltimore and Philadelphia. The trip marks the first time an English engine built for an English railway has hauled an American passenger train. It was a little over a century ago that the "Stourbridge Lion," the first locomotive to run on rails in America, was brought to these shores for the Delaware & Hudson Railroad. The "King George V" left Camden Station, Baltimore, October 17 at 8:30 o'clock, ran to Washington and back, and then to Philadelphia and back, stopping once each way for water.

The train hauled by the English locomotive consisted of a dynamometer car used for recording various power, distance and speed measurements; three individual seat coaches of the latest design; two Pullman coaches; and one of the official cars of the Baltimore & Ohio.

Baltimore & Ohio officials who made the trip included: C. W. Galloway, vice president of operation and maintenance; E. W. Scheer, general manager; George H. Emerson, chief of motive power and equipment; Earl Stimson, chief engineer maintenance; R. W. Brown, general superintendent; C. A. Gill, general superintendent of motive power; F. X. Milholland, assistant to senior vice president; F. G. Hoskins, superintendent Baltimore division; C. M. Shriver, superintendent Baltimore terminals; and G. R. Galloway, district master mechanic; W. L. Robison, superintendent locomotive and fuel performance; W. W. Calder, master car builder; and W. B. Whitsitt, mechanical engineer.

Other passengers were, Edward Hungerford, centenary director of the Baltimore & Ohio celebration at Halethorpe; Adele Gutman Nathan, pageant director; and Margaret Talbott Stevens, author of the pageant narrative and associate editor of the Baltimore & Ohio Magazine.

Train Leaves At 0.00

A unique time computation of 0.00 has resulted from the adoption by the German railways of the 24-hour time table. Theoretically, of course, the new system of reckoning time calls for a computation of from 0 to 24, whereby the arrival of trains at midnight is to be designated with 24. But though no one ever thought of 0.00 as a time specification for any train on wheels this vacuous numeral has notwithstanding become an accepted, official, item of the German time table in which the slow passenger train for Leipzig is scheduled as leaving Anhalter Bahnhof in Berlin at 0.00 o'clock.

Of course it's disagreeable to breathe the other car's dust, but it's so much worse to bite into a roadside clay bank.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

ALBA B. JOHNSON, president of the Railway Business Association in a letter to members of the association points to conditions which he says indicate great industrial activity in 1928 and warns that unless the railroads are prepared to handle the freight private ownership of the roads might be endangered.

Mr. Johnson says:

"A serious situation seems to have developed in respect to Class 1 railway equipment as reflected in the report of the American Railway Association, published October 26, covering nine months to October 1. As has recently been usual, the installation of locomotives and cars were fewer than the retirements; but whereas heretofore through enlargement of units the total power and car capacity have constantly increased the turn has come. The freight locomotive increments and modernizations since January 1 were exceeded by retirements measured in tractive pounds of effort, and the car capacity owned October 1 is only a quarter of 1 per cent greater than on January 1.

"Apart from the anxiety which all concerned should feel over transport preparedness at any normal time, are we not confronted with a probable traffic emergency in 1928? I allude to the strengthened power of the farmers and to the impending resumption of low-priced automobile manufacture now held back for a demonstration of the new Ford model.

"This will greatly benefit the oil industry, the mills fabricating car parts or materials, and all industries dealing in shelter, furniture, food, clothing and luxuries whose business expands from resumption in any occupation so vast as agriculture or the automotive industry.

"Evidently 1928 will bring a severe test. At each juncture from now on the preservation of private ownership will be a struggle between satisfactory service, on the one hand, and government ownership propaganda on the other."

Traffic Control by Telephone

Trains on approximately 60 per cent of the total mileage of this country are now being handled by means of telephone, according to reports submitted to the eleventh annual convention of the telegraph and telephone section of the American Railway Association.

Miles of road over which trains are being operated by means of orders transmitted by telephone totaled 143,324 on January 1, 1927, according to the report submitted by the committee on communication. Compared with January 1, 1926, this was an increase of 3,364 miles and an increase of 23,770 miles compared with January 1, 1920.

While the use of the telephone for the transmission of train orders is increasing, the report showed that the use of the telegraph for that purpose is decreasing almost proportionately. On January 1, 1927, miles of road on which train orders were being transmitted by telegraph totaled 113,659 compared with 118,628 miles on January 1, 1926, and 134,667 miles on January 1, 1920, or a reduction compared with seven years ago of 16 per cent.

In some busy signal towers, especially at terminals where there are heavy train movements, requiring an operator and a leverman, the use of the "loud speaker" enables the leverman to keep posted constantly, and to anticipate certain train movements so that he can more quickly line up such movements when directed by the operator, thus saving seconds or minutes which are important. Through the use of portable sets, section men, bridge and building gangs and others at work along the right-of-way can also keep in constant communication with headquarters. The use of the telephone also enables the railroads to bring many other efficiencies and economies which otherwise would not be possible.

Daily Movement of Freight Cars

The average daily movement per freight car for the first eight months in 1927 was 30 miles, the highest mark ever attained in any corresponding period, according to reports filed by the carriers with the bureau of railway economics. This was an increase of four-tenths of one mile above the best previous average established in the first eight months of 1926. The daily average movement per car in August was 30.9 miles compared with 31.5 miles in August last year.

In computing the average movement per day, account is taken of all freight cars in service, including cars in transit, cars in process of being loaded and unloaded, cars undergoing or awaiting repairs and also cars on side tracks for which no load is immediately available.

The average load per car for the first eight months in 1927 was 27.3 tons, an increase of two-tenths of one ton above the average for the first eight months in 1926. The average load per car for August this year was 27.6 tons compared with 27.9 tons in August last year.

New Safety Record

A new record in safety was established by the railroads of this country in the first six months this year when only two passengers lost their lives in train accidents, according to reports filed by the rail carriers with the Interstate Commerce Commission.

This was the smallest number of fatalities among passengers resulting from train accidents ever reported for the first six months in any recent year. In the first half of 1926, fatalities among passengers, as a result of accidents to trains, numbered 22 while there were 52 in 1925; 23 in 1924 and 8 in 1923.

Passengers injured in the first half of 1927 as a result of train accidents numbered 776 compared with 656 in the same period last year and 758 in the same period in 1925.

In other than train accidents, 39 passengers lost their lives in the first half of 1927 compared with 41 in the same period last year. Of the 38, reports showed 19 were killed in getting on or off cars or locomotives while eight were killed by being struck or run over not at public crossings.

New Canal Record

Unofficial data show that the commercial transit of the Panama Canal for 30 days of October established a new high record for a month's period. With one more day to go, 551 vessels have passed through, exceeding the high record of August, 1927, by eight merchantmen.

First Roller Bearings on Pacific Coast

Equipped with the first roller bearings to be used by any Pacific Coast railroad, six new 77-foot steel dining cars costing approximately $60,000 each, will be placed in service by the Southern Pacific in December, according to F. W. Mahl, general purchasing agent for the company. "The new cars," Mahl said, "are the finest and most costly yet built for service in the West. As a trial of the desirability of roller bearings under the conditions of western

railroad travel, we are employing three different types of bearings, each type being fitted to two cars."

To Ask For Bus Control

After nearly two years of studying motor coach and motor truck operations, the Interstate Commerce Commission will ask congress to enact legislation subjecting interstate carriers to regulation such as now governs other common carriers.

Large Rail Orders

A number of large rail orders were placed during October. The Pennsylvania ordered 200,000 tons distributed as follows: Carnegie Steel Co., 60,000 tons; Illinois Steel Co., 40,000 tons, Bethlehem Steel Co., 87,000 tons, and the Inland Steel Co., 87,000 tons. The Santa Fe ordered 124,700 tons divided among the following: Colorado Fuel & Iron Co., 87,800 tons; Illinois Steel Co., 17,300 tons; Inland Steel Co., 17,300 tons and the Bethlehem Steel Co., 2,300 tons. The Chesapeake & Ohio ordered 55 000 tons divided between the Illinois Steel Co., the Inland Steel Co., and the Bethlehem Steel Co. The Union Pacific ordered 30,000 tons divided between the Illinois Steel Co., the Inland Steel and the Colorado Fuel & Iron Co. The St. Louis-San Francisco ordered 200 track miles of 110-lb rail.

Santa Fe Breaks Record

All records for train movement of the Santa Fe coast lines through Barstow for a 24 hour period were broken September 29-30, 99 trains, 69 freight and 30 passenger trains, having been handled through that terminal. The movement totaled 4054 cars, 3370 being freight cars.

Railway Merger Protest Denied

The I. C. C. has denied the motion of the Milwaukee railroad for dismissal of the application of the Great Northern and Northern Pacific railways for authority to consolidate as the Great Northern Pacific and to transfer to the new road the control of the Burlington. The ruling was announced by Charles D. Mahaffie, director of the commission's bureau of finance, presiding at the hearing. Exception to the ruling was taken by counsel for the Milwaukee; it was noted in the records and will be argued later.

I. C. C. Passes on Rental Contract

Because of lack of jurisdiction, the I. C. C. has refused to abrogate a contract under which the Rock Island operates over tracks of the Denver & Rio Grande between Denver and Pueblo. At the same time the commission advised both railroads to reach an agreement for revision of the existing contract under which the Rock Island rents the Rio Grande's line between the two cities. The Rock Island's complaint asserted that under terms of a 50-year-old contract it was obliged to pay the Rio Grande $345,000 a year as rental and contended it had never been able to utilize the full joint trackage contracted for. The Rock Island further offered to pay $186,000 yearly for such of the Rio Grande's lines as it found useful and asked the commission to abrogate the old contract.

Pacific Coast Production Gains

Though the estimated car loadings for the United States for October, November and December, this year, show a decrease of 1.9 per cent in the 27 principal commodities, California, with the combined loadings of its sister states, Arizona, Nevada and New Mexico, comprising the territory of the Pacific Coast transportation advisory board, shows an increase of 9.3 per cent, California contributing the largest part of this production. It has been noted that California over a period of years has shown an upward trend in car loadings of approximately 10 per cent, a year, and this is particularly remarkable at this time, it is pointed out, when the nation as a whole shows a retardation. Car loadings are taken by many economists as true business barometers and if used in this instance show these four states to be very favorably situated for the coming 90-day period from the standpoint of business economics.

Railroad Earnings in September

The net railway operating income of the Class 1 railroads in September amounted to $132,770,069, which, for that month, was at the annual rate of return of 5.11 per cent on their property investment, according to reports filed by the carriers with the bureau of railway economics. In September, 1926, their net railway operating income was $145,763,441 or 5.76 per cent on their property investment. This compiliation as to earnings in September is based on reports from 183 Class 1 railroads representing a total mileage of 238,534 miles.

Gross operating revenues for September amounted to $565,090,904 compared with $591,239,836 in September, 1926, or a decrease of 4.4 per cent. Operating expenses in September totaled $386,388,010 compared with $398,762,376 in the same month in 1926 or a decrease of 3.1 per cent. Class 1 railroads in September paid $35,562,698 in taxes. This brought the total tax bill of the Class 1 railroads for the first nine months in 1927 to $288,364,848, a decrease of $4,022,134 or 1.4 per cent below the corresponding period in 1926. Eleven Class 1 railroads operated at a loss in September of which six were in the eastern, one in the southern and four in the western district. Class 1 railroads for the first nine months in 1927 had a net railway operating income amounting to $808,304,350 which was at the annual rate of return of 4.61 per cent on their property investment. During the corresponding period of the preceding year, their net railway operating income amounted to $891,417,514 or 5 22 per cent on their property investment. Gross operating revenues for the first nine months in 1927 amounted to $4,654,873,475 compared with $4,764,635,482 during the corresponding period in 1927 or a decrease of 2.3 per cent. Operating expenses for the first nine months period in 1927 totaled $3,472,756,316 compared with $3,500,006,044 during the same period the year before.

Ship Building Declines

American shipbuilding fell 50,000 gross tons in the quarter ended September 20, 1927, below the total for the previous quarter, according to Lloyd's Register.

This country dropped from fifth place at the end of June to seventh place. France and Denmark have surpassed it in ship construction in the period of report, only 3 per cent of the 3,000,000 tons merchant shipping contracts throughout the world being under the auspices of American yards.

At the end of September last year the United States had 119,723 gross tons under construction, whereas the figure for September this year was only 91,070.

The world's total of 3,000,000 is 100,000 tons under the prewar record on June 30, 1914, yet it is nearly 1,250,000 more than a year ago. Great Britain and Ireland are at the top now with 1,536,416 tons—a gain of 146,028 over the preceding quarter and 761,619 more than the quarter expiring with September a year ago.

Traffic Control

Centralized Traffic Control is the title of an extremely interesting booklet issued by the General Railway Signal Co., of Rochester, N. Y. The text is by Sedgwick N. Wight, commercial engineer, and the booklet is issued as Bulletin 154. The problem of centralized traffic control by signal is discussed from the beginning of railroading, with illustrations in color. An interesting chapter is that describing train dispatching with particular reference to modern signal arrangements.

Locomotive Progress

Representative examples of modern motive power are shown in a most interesting way, and briefly too, in a booklet issued recently by the Superheater Company of New York with the title used as a headline for this review.

No attempt has been made to show all the very latest locomotives, nor are all the locomotives included necessarily the latest ones built. But they are representative and give a fair cross section of steam power in America today. In each instance, general dimensions are given. These have been carefully compiled from the records of the Superheater Company's engineering department, and checked against and supplemented by those of the builders. In some cases they were checked by the railroads themselves. All the locomotives illustrated in the booklet are equipped with Elesco superheaters, either of the Type "A" or Type "E" design. A number are equipped with either Elesco feedwater heaters or Elesco exhaust steam injectors showing the general tendency of railroads to accept these economy devices. Other facts concerning the design, equipment or service are given. The booklet contains 40 pages with 19 illustrations of locomotives used on roads in widely different parts of the country—Canada, the East, the South, the Middle West and the Pacific Coast, a range of viewpoint sufficiently varied to make the examples interesting and informative. These examples include the Berkshire 2-8-4 of the Boston & Albany; Texas 2-10-4 of the Texas & Pacific; the Mayflower 4-8-2 of the New Haven; Pacific 4-6-2, Southern Railway; Hudson 4-6-4, New York Central; Mohawk 4-8-2, New York Central; the Nickel Plate's 4-6-4 type; Northern Pacific 4-84; Illinois Central 2-8-4; Union Pacific three-cylinder 4-12-2, and others. Copies of the booklet may be obtained by addressing the Superheater Company, 17 East 42nd Street, New York.

Railway Construction

Tracks and Yards

CALIFORNIA.—The Northern California has applied to the I. C. C. for authority to build a line of 31 miles from Westwood, south to the line of the Indian Valley, which connects with the Western Pacific at Paxton, thus forming a shorter route to Sacramento. It is proposed to acquire part of the line from the Red River Lumber Co.

CANADA.—The Canadian National is said to have purchased six acres for a distributing yard to provide better freight service for General Motors Co.

FLORIDA.—The Alabama & Western Florida has applied to the I. C. C. for authority to construct an extension of 12.5 miles from Chipley to Graceville.

IDAHO.—The Western Pacific it is said, will build a connection between its main line at Wells, and the Union Pacific branch line from Rogerson. The connection, 6,000 feet long, will cost about $160,000. The project includes two highway grade separations where the new line of the Western Pacific would cross the Southern Pacific.

ILLINOIS.—The Pennsylvania has awarded a contract to the Mellon Construction Co., Chicago for laying track on a change of line from Collinsville to St. Jacob, to cost $100,000.

—The I. C. C. has granted the Illinois Central an extension of time to June 30, 1928, to complete the Southern Illinois & Kentucky line from Edgewood to Metropolis, and from Fulton to a point near the Ohio River.

ILLINOIS.—The Rock Island has started work on new yard facilities at Joliet. The project calls for 22,000 feet of new tracks, a new yard office and the relocation of an industry track for the new yard. The estimated cost is $180,000. New yard facilities are also under construction at Peoria. This project calls for 4,800 feet of additional tracks and a re-arrangement of tracks near the enginehouse, to cost about $60,000.

KANSAS.—The Rock Island is making extensive improvements at its Armourdale yard. The program is to extend over three years. The work for 1927 includes 22 additional yard tracks and the relaying of a part of the existing yard tracks.

MICHIGAN.—The Detroit, Grand Haven & Milwaukee, the Pontiac, Oxford & Northern and the Michigan Air Line, subsidiaries of the Grand Trunk, have filed with the I. C. C. a joint application for authority to construct a terminal transfer or belt line of 6.63 miles, connecting their existing lines at Pontiac.

—The Pere Marquette has applied to the I. C. C. for authority to construct an extension from Wixon to Pontiac, about 7 miles, connecting with it, as "part of a general plan to construct a line of railroad forming a cut-off from Grand Junction to Woodbury" 63 miles, and an extension from Green Oak to Lennox, 57 miles, to be built at some future date. The application says the proposed construction will reduce expenses through a material lessening of the distance via its lines between Chicago and Buffalo and the elimination of limiting grades, and will permit the company to avoid passing through traffic within the terminals of Detroit in addition to providing service to further territory.

The I. C. C. has granted the Detroit & Ironton an extension from December 31, 1927, to December 31, 1929, to complete a line from Durban to Malinta.

MISSOURI.—The Missouri Pacific has applied to the I. C. C. for authority to construct a line from Illmo, to a connection with the Cape Girardeau Northern, 3.3 miles, and to purchase and reconstruct the latter line from its present terminus at Ancell to a point two miles beyond Cape Girardeau, 7 miles. The Cape Girardeau Northern, which is now in the hands of the receiver, discontinued service into Cape Girardeau several years ago after river overflows and consequent erosions made its tracks unfit for use by rolling equipment.

MONTANA.—The Great Northern, it is said, will build an 80-mile extension next summer to open an important spring wheat section in the Turner region, subject to the approval of the I. C. C. and the Montana commission. The estimated cost is $2,000,000.

—The Northern Pacific has awarded a contract to the Morrison-Knudsen Co., Boise, for a new line along the Bitter Root River between Florence and Hamilton, about 25 miles. The project involves the removal of that part of the Bitter Root branch which extends from Missoula to Darby, from the west side to the east side of the river. Including right of way, the estimated cost is $900,000.

NEVADA.—See item about the western Pacific under Idaho.

NEW YORK.—The Albany port district commission has applied to the I. C. C. for authority to construct a three-mile terminal railroad to connect the docks now under construction with the tracks of the New York Central, Delaware & Hudson and West Shore.

—The Long Island is said to be considering 25 grade eliminations for the coming year.

—The New York Central is said to be considering the extension of its four-track line from Manitau to Beacon, 10 miles.

OHIO.—See item about the Detroit & Ironton under Michigan.

OKLAHOMA.—The Rock Island has started work on new yard facilities at Sayre, to cost about $75,000. The programme calls for the moving of the freight house, eating house, freight and cotton platform, and linemen's tool house to a new location, two additional yard tracks, as well as many other improvements in the yard facilities. This company has applied to the I. C. C. for authority to build an extension of about 10 miles south of Bowlegs.

VIRGINIA.—The Pennsylvania has awarded a contract to the Tunstall-Johnson Co., Norfolk, for grading and track work from North Junction to Camden Heights, and for the Julian avenue and Little Creek yards in connection with the Little Creek improvements, to cost $300,000.

—The Big Sandy & Cumberland, a subsidiary of the Norfolk & Western, has applied to the I. C. C. for authority to construct an extension to be known as the Home Creek branch, from a point near Hurley to a point on the east bank of the Levisa Fork of the Big Sandy River near the mouth of Home Creek, 14.05 miles, estimated to cost $3,650,000; also to construct and operate as a standard gauge railroad 13.5 miles of industrial tracks on the Levisa River, estimated to cost about $2,340,000.

Buildings and Structures

ALABAMA.—Demopolis. The St. Louis-San Francisco has awarded a contract to Will F. Pauly for a one-story brick combined passenger and freight station.

ARKANSAS.—Georgetown. The Missouri & North Arkansas has awarded a contract to the List & Weatherly Construction Co., Kansas City, for a pivot pier and a 300-ft. draw span in the bridge over the White River.

—Gurdon. The Missouri Pacific has awarded a contract to Fairbanks, Morse & Co., Chicago, for a 400-ton reinforced concrete mechanically operated coaling station.

CALIFORNIA.—Carquinez Straits. The Southern Pacific is said to be planning a bridge from Bowhead Point in Contra Costa county to Army Post in Solano county to supplant the transport ferry service between Port Costa and Benicia.

—Los Angeles. A contract has been awarded to the North Pacific Construction Co., for a reinforced concrete viaduct across the industrial district yards at First street. The contract price of the viaduct is $613,400, while the cost of the land for approaches and track changes will make the total estimated cost about $1,500,000. The cost of construction will be divided among the Union Pacific, the Santa Fe, the Los Angeles Railway and the city of Los Angeles.

—Middle River. The Santa Fe is said to be planning a bascule type bridge over the Middle River.

CANADA.—Camrose, Alta. The Canadian National has awarded a contract to H. G. Macdonald & Co., Edmonton, for a 100-ton mechanical coaling station.

—Tecumseh, Ont. The Canadian National is said to have prepared plans for a 30-stall brick and steel enginehouse, with machine shop and accompanying yard facilities, to cost about $1,000,000.

—Montreal, Que. The Canadian National has been authorized by the Canadian government to expropriate lands necessary for a new terminal in Montreal. The road now has two main stations in the city, i.e. Bonaventure and La Gauchtiere, familiarly known as the Tunnel Terminal. The former, which handles the bulk of Canadian National Montreal business, is an old structure and is reached by lines having many highway grade crossings. Nothing definite has been made public about the company's plans, but apparently it contemplates abandoning Bonaventure, and developing a large new station at the Tunnel Terminal, which is at the end of the former Canadian Northern's electrified tunnel under Mount Royal.

—Moose Jaw, Sash. The Canadian National has awarded a contract to the Bennett & White Construction Co., Calgary, for a 100-ton mechanical coaling station.

—Willowbunch, Sask. The Canadian National has awarded a contract to W. A. Dutton, Winnipeg, for a station and platform.

GEORGIA.—Macon. The Southern Railway is said to be considering a 24-stall enginehouse with boiler house, water tank and office building, estimated to cost around $300,000.

ILLINOIS.—Chicago. The Pennsylvania has awarded a contract to the Kelly-Atkinson Co., Chicago, for the superstructure on the 47th street bridge.

—DuQuoin. The Perfection Coal Co., has purchased an automatic electric coaling station equipment from the Roberts & Schaefer Co., Chicago.

—Lombard. The Chicago & North Western has awarded a contract to S. G. Cool, Chicago, for a hollow tile passenger station, to cost about $15,000.

—Streator. The Santa Fe is said to have authorized a general program of improvements to include a one-story brick and concrete passenger station, a freight station, a 500-ton steel coaling station, rearrangement of water facilities, and necessary track changes.

INDIANA.—Bedford. The Chicago, Indianapolis & Louisville is receiving bids for a frame addition to its freight station, estimated to cost $15,000.

—Economy. The Chesapeake & Ohio has awarded a contract to the Railroad Water & Coal Handling Co., Chicago, for a water treating plant.

—Griffith. The Erie is said to have prepared plans for a steel bridge.

KANSAS.—Topeka. The Santa Fe received bids until October 15 for a four-story reinforced concrete and steel combined recreation center and apprentice school. Bids also closed on the same date for a reinforced concrete and steel structure to house the Santa Fe fire department.

MASSACHUSETTS.—Pittsfield. The New Haven has awarded a contract to C. B. Lindholm, Pittsfield, for a steel bridge at West Hoosatonic street. The city of Pittsfield desired the widening of the street at that point where it passes under the railroad near the passenger station. The estimated cost, $55,000, will be shared by the city, the county and the railroad.

MICHIGAN.—Detroit. The Michigan Central, the Grand Trunk Western and the city of Detroit have prepared plans for a steel and concrete highway bridge at Joseph Campau avenue, as part of the general program of grade separation in that city. This part of the work is estimated to cost $789,000.

MISSISSIPPI.—Columbus. The St. Louis-San Francisco has awarded a contract to Will F. Pauly for a one-story brick combined passenger and freight station.

MISSOURI.—Jefferson City. The Missouri Pacific has awarded a contract to the Roberts & Schaefer Co., Chicago, for a 140-ton capacity reinforced two-track coaling plant.

—St. Louis. The Big Four has awarded a contract to the Woerman Construction Co., St. Louis, for a two-story brick service building, to cost about $16,000.

—Trenton. The Rock Island will construct 15-ft. extensions to nine stalls of the enginehouse.

MONTANA.—Glendive. The Northern Pacific has awarded a contract to Charles Skooglun, St. Paul, for the reconstruction of two sections of the enginehouse, with brick and concrete to provide 14 stalls, 135 ft. long. Two of the stalls will be equipped with drop pits for handling truck, trailer and tank wheels. The estimated cost of the improvement is $147,000.

—Whitefish. The Great Northern has awarded a contract to the T. B. Butler Construction Co., Seattle, for a passenger station to cost about $60,000.

NEBRASKA.—Lincoln. The Rock Is-

land is said to be planning a water station with a 50,000-gal. conical bottom steel tank.

NEW JERSEY.—Boonton. The Lackawanna has awarded a contract to F. D. Hyde, Inc., New York, for two signal towers to cost $20,000. One is to be erected at Boonton and the other at Denville.

—Jersey City. The Pennsylvania has awarded a contract to the Automatic Sprinkler Corpn., for a sprinkler system on Pier K.

—Robbinsville. The Pennsylvania has awarded a contract to the T. J. Foley Co., Pittsburgh, for the reconstruction of a bridge, to cost $25,000.

—Weehawken. The New York Central has awarded a contract to the M. A. Long Co., Baltimore, for wheat cleaning machinery in its grain elevator.

NEW YORK.—Harmon. The New York Central has awarded a contract to the Interstate Electric Construction Corpn., Springfield, for electric wiring and lighting systems in the enginehouse and yard. Contracts have been awarded to the Walsh Construction Co., Syracuse, for exterior piping for shop facilities, and to the National Boiler Washing Co., Chicago, for piping between the annex building and enginehouse and the power house.

—New York. The New York Central has awarded a contract to the Edward J. Duffy Co., Inc., Weehawken, for a platform, canopies and driveways, with drainage, between 140th and 146th streets.

—Niagara Falls. The New York Central has awarded a contract to the Jobson-Gifford Co., New York, for the reconstruction of a bridge.

—North Tonawanda. The New York Central has awarded a contract to Wright & Kremers, Inc., Niagara Falls, for a freight house, canopies and platforms.

OHIO.—Hamilton. The Baltimore & Ohio has awarded a contract to the Vang Construction Co., Cumberland, for a bridge to cost $60,000.

—Hamler. The Baltimore & Ohio has awarded a contract to the Pittsburgh-Des Moines Steel Co., Pittsburgh, for a water treating plant.

—Kellar. The Baltimore & Ohio has awarded a contract to the Pittsburgh-Des Moines Steel Co., Pittsburgh, for a water treating plant.

Middletown. The Baltimore & Ohio is said to be preparing to erect a number of bridges.

OKLAHOMA.—Muskogee. The Missouri-Kansas-Texas has awarded a contract to the Austin Brothers Construction Co., Austin, for a one-story forge and blacksmith shop and a one-story woodworking shop.

—Sayre. The Rock Island has awarded a contract to the T. S. Leake Construction Co., Chicago, for a one-story brick passenger station.

PENNSYLVANIA.—Bethlehem. The Central of New Jersey has awarded a contract to Joseph E. Nelson & Sons for a power house at its new engine terminal.

—Fernwood. The Pennsylvania has awarded a contract to the T. J. Foley Co., Pittsburgh, for an overhead highway bridge to eliminate five grade crossings, to cost about $80,000.

—Lancaster. The Pennsylvania has awarded a contract to Sinclair & Grigg, Philadelphia, for a bridge to eliminate the Mannheim Pike grade crossing, to cost $40,000.

—Lansdowne. The Pennsylvania is said to be planning a bridge.

—Philadelphia. The Pennsylvania has awarded a contract to Sinclair & Grigg for a steam line from the tidewater terminal power plant to the perishable products terminal building, to cost $50,000. This company expects to start work soon on a cold storage warehouse, with auxiliary equipment, at the company's new produce terminal.

—Pittsburgh. The Pennsylvania has awarded a contract to the John F. Casey Co., Pittsburgh, for seven temporary train platforms at the east end of its train shed.

—Newcastle. The Baltimore & Ohio has awarded a contract to the Pittsburgh-Des Moines Steel Co., Pittsburgh, for water treating plants at Newcastle and Newcastle Junction, to cost $6,000 and $10,000 respectively.

TENNESSEE.—Memphis. The St. Louis-San Francisco has awarded a contract to the Ogle Construction Co., Chicago, for a 50-ton steel electrically operated coaling station.

—Monterey. The Tennessee Central has ordered a junior "N. W." type electrically operated cinder conveyor from the Roberts & Schaefer Co., Chicago.

TEXAS.—Big Spring. The Texas & Pacific has awarded a contract to the Austin Brothers Construction Co., Austin, for a steel shop building, to replace a building destroyed by fire.

—Galveston. The Texas & New Orleans has awarded a contract to the Johnston Construction Co., Galveston, for a concrete and timber highway subway, the cost, which is estimated at $25,000 to be borne jointly by the city and the railroad.

WASHINGTON.—Appleyard. The Great Northern is said to be planning a shop for the repair of electric locomotives. The building will be of brick and steel and will be served by four tracks with one drop pit and two traveling cranes of seven and one half tons and 35 tons respectively. Estimated cost is $95,000.

Locomotive Orders

According to the A. R. A. locomotives placed in service in the first nine months of 1927 totaled 1,476 of which 177 were installed in September. In the first nine months of last year, the railroads placed in service 1,664 locomotives. Locomotives on order October 1, this year, numbered 134 compared with 443 on October 1, last year.

Locomotives in need of repair on Class 1 Railroads on October 15 totaled 8,759 or 14.4 per cent of the number on line, 7.8 per cent in need of classified repairs and 6.6 per cent in need of running repairs. This was an increase of 414 locomotives compared with the number in need of such repair on October 1, at which time there were 8,345 of 13.6 per cent, the lowest number ever reported, Serviceable locomotives in storage on October 15 totaled 5,401 compared with 5,720 on October 1.

There were practically no locomotive orders of any size placed during October. The American Locomotive Co., received an order for two consolidation type locomotives, and Baldwin received orders from the Ferrocarrill de Pacifico (Colombia) for ten 4-8-0 locomotives and the Chicago, South Shore & South Bend for two 80-ton electric locomotives, the electric equipment to be furnished by Westinghouse. There was, however, an increase in inquiries. The Canadian National inquired for 10 eight-wheel switchers, the Detroit & Toledo Shore Line for three to four Mikados, the Colombian government for nine 2-6-2 locomotives with tenders, and the United Fruit Co., for one to 20 oil-electric 242-242 type locomotives. It is expected that the Chicago & North Western will be in the market for 20 locomotives, the Argentine State Railways for 60 locomotives and the Estonia State Railways for five locomotives.

Passenger Car Orders

Our records show orders placed during October for 67 regular passenger service cars, 26 gas-electric cars and one trailer. The regular service car orders include 15 coaches, one parlor car and two dining cars for the Chicago, North Shore & Milwaukee from the Pullman Co., 12 dining cars and 12 combination library club cars, especially equipped, for the Santa Fe from the Pullman Co., 15 first-class and 10 second-class passenger cars for the Ferrocarrill de Pacifico from the American Car & Foundry Co. The gas-electric cars were ordered by the Seaboard Air Line, the Baltimore & Ohio, the New York Central, the New Haven, the Central of Vermont, the Santa Fe, the Lehigh Valley, the Alaskan government, and the Richmond,

Fredericksburg & Potomac. It is reported that the Chicago & North Western is planning to purchase 43 suburban coaches, the C. M. & St. P., 10 baggage cars, and the Fresno Traction Co., 10 street cars.

Freight Car Orders

According to the car service division of the A. R. A. the Class 1 railroads installed 58,705 freight cars in service during the first nine months of 1927. This was a decrease of 26,578 compared with the number placed in service during the corresponding period last year; 6,431 freight cars were installed in September, including 3,060 box cars, 2,615 coal cars and 397 refrigerator cars. The railroads on October 1 had 14,833 freight cars on order compared with 16,846 on the same date in 1926.

A report issued by the A. R. A. shows that Class 1 roads had 153,317 surplus freight cars in good repair and available for service on October 15. This was a decrease of 8,651 cars compared with September 15, at which time there were 161,968. Surplus coal cars on October 15 totaled 47,122, an increase of 8,655 compared with September 15, while surplus box cars totaled 83,664, a decrease of 5,287 for the same period. Reports also showed 13,059 surplus stock cars, a decrease of 3,501 above the number reported September 15, while surplus refrigerator cars totaled 2,021, a decrease of 8,925 for the same period.

We find only a few scattered orders for new freight equipment placed during October. The Virginia Coal & Coke Co., ordered 400 mine cars from the American Car & Foundry; the Pittsburgh Coal Co., 200 mine cars from the Lorain Steel Co.; the New River & Pocahontas Consolidated Coal Co., 150 mine cars from the American Car & Foundry, and the Chicago, South Shore & South Bend, four caboose cars from the American Car & Foundry. Koppel received orders for four air dump cars from H. W. Taylor, Hagerstown, and one air dump car from the Central Alloy Steel Co. It is expected that the Chicago & North Western will be in the market for 500 box cars.

Bus and Truck Orders

A statement from the department of commerce, based on reports received from national automobile chamber of commerce members shows that in September 32,564 trucks and buses were produced (factory sales) by them. Recent bus orders include the following: Denver & Interurban Transportation Co., two parlor motor buses from the Yellow T. & C. Mfg. Co.; New York Central, three from Pierce Arrow Co., and two from the International Motor Co.; N. Y. State Railways, three from the White Co.; Northland Transportation Co., six from Will Motors Co., Southern Pacific Motor Transport, three from the American Car & Foundry and 22 from the Yellow T. & C. Mfg. Co.

Changes in Personnel

Executive and Operating

George A. Young has been elected vice president of the Port Huron & Detroit with headquarters at Port Huron.

J. H. Walsh, general manager of the Quebec Central, has been elected vice president, succeeding **I. G. Ogden,** resigned. Mr. Walsh will continue to serve as general manager, with the title of vice president and general manager.

J. H. Stanfiel, general manager of the Southern, lines west, with headquarters at Cincinnati, has been appointed assistant to the vice president with headquarters at Washington.

Thomas W. Wilson has been elected president of the Wilmington & Philadelphia Traction Co., and of the subsidiary railway and bus companies in both Delaware and Pennsylvania. He was also re-elected general manager.

The Atlantic Coast Line has made the following changes and appointments: **C. C. Blanc,** superintendent of terminals of the Jacksonville terminals; **T. W. Hansell,** assistant superintendent of terminals; **F. B. Langley,** district superintendent at Ocala; **G. E. Rollins,** superintendent of the Lakeland district at Dunnellon.

J. L. Mulroy, assistant superintendent of the La Crosse division of the Burlington, has been appointed assistant superintendent of the Beardstown division with headquarters at Centralia. **W. H. Hillis** succeeds Mr. Mulroy at La Crosse.

W. M. Neal, assistant to the vice president of the Canadian Pacific, has been appointed general manager of the western lines, with headquarters at Winnipeg, succeeding **Charles Murphy,** who has retired after 44 years in the service of the C. P. R. **H. J. Humphrey,** general superintendent of the Algoma district at North Bay, succeeds Mr. Neal as assistant to the vice president. Other appointments are: **Andrew Halkett,** general superintendent of the Algoma district; **N. McMillan,** superintendent of the Trenton division at Toronto, succeeding **H. J. Main,** who has been transferred to Moose Jaw; **F. Davis,** assistant superintendent of the Trenton division; **F. M. Rutter** has been transferred to Smith's Falls, replacing **S. W. Crabbe,** who has been transferred to London.

T. A. Sweeney, superintendent of the eastern division of the Chicago Great Western at Chicago, has been appointed assistant to the general manager with the same headquarters. **S. V. Rowland,** superintendent of the northern division at St. Paul has been appointed superintendent of the eastern division succeeding Mr. Sweeney. **C. J. Kavanagh,** trainmaster of the northern division succeeds Mr. Rowland as superintendent.

W. H. Heun, superintendent of transportation for the Chicago & Joliet Electric R. R., has been appointed general manager.

P. J. McManus, general superintendent of the Elkin, Joliet & Eastern, has been appointed general manager, with headquarters, as before, at Joliet. The position of general superintendent has been abolished.

J. W. Mitchell, auditor and car accountant of the Groveton, Lufkin & Northern, has been appointed superintendent and general freight and passenger agent, succeeding **R. D. Crow,** resigned.

F. G. Swafford, superintendent of the Indiana Harbor Belt at Gibson, has been appointed general superintendent with the same headquarters with jurisdiction over the transportation, motive power and car departments. **C. E. Hinchman,** superintendent of transportation, succeeds Mr. Swafford as superintendent. The positions of general manager and superintendent of transportation have been abolished. **C. L. Kinsey** has been appointed superintendent of car service with headquarters at Gibson.

A. J. Smith, superintendent of the Ft. Wayne division of the Lake Erie & Western district of the Nickel Plate with headquarters at Muncie, has been appointed assistant superintendent of the Sandusky and Ft. Wayne divisions of the same district with the same headquarters.

S. D. Canfield, general agent of the North & South, has been appointed gen-

eral manager, with headquarters, as before, at Salt Creek.

The central and southern districts of the Seaboard Air Line have been consolidated and are now designated as the southern district. **T. W. Parsons,** general superintendent of the former southern district with headquarters at Arcadia, has been appointed general superintendent of the new southern district with headquarters at Jacksonville. **G. R. Carlton,** general superintendent of the western district at Savannah has been transferred in the same capacity to the northern district, with the same headquarters, succeeding **G. V. Peyton,** who has been relieved at his own request due to ill health. **E. C. Bagwell,** general superintendent of the central district, succeeds Mr. Carlton as general superintendent of the western district at Savannah. **C. S. Cannon** has been appointed assistant superintendent and trainmaster of the North Florida division at Tampa. **J. W. Lytton** has been appointed superintendent of the Charlotte, Monroe & Columbia and the Chesterfield & Lancaster (parts of the Seaboard Air Line) with headquarters at Cheraw, succeeding **C. Lane,** who has been appointed superintendent of the Raleigh & Charleston (also a part of the Seaboard Air Lines).

The Southern Railway has made the following changes and appointments: **R. E. Simpson,** general manager, lines west with headquarters at Cincinnati; **W. C. Hudson,** general manager, lines east with headquarters at Charlotte; **J. C. Austin,** general superintendent of the Queen & Crescent district at Chattanooga; **J. W. Payne,** superintendent of the Birmingham division at Birmingham; **J. T. Moon,** superintendent of the Georgia, Southern & Florida, (part of the Southern) at Macon; **B. F. Langford,** superintendent of the New Orleans & Northeastern (also a part of the Southern) at Hattiesburgh; **Clark Hungerford,** superintendent of the Mobile division at Selma; **W. E. M. Neal,** superintendent of the Knoxville & Augusta and the Knoxville & Bristol divisions at Knoxville, succeeding **W. P. Hood,** deceased.

Financial and Legal

P. B. Lacy has been appointed assistant treasurer of the Northern Pacific with headquarters at St. Paul.

James E. Duffy, Jr., has been elected secretary and general attorney of the Port Huron & Detroit with headquarters at Port Huron, succeeding **R. H. Neilson,** who has resigned to accept service with another company.

E. Z. Wallower has been appointed assistant receiver of the Southwestern Missouri with headquarters at Webb City.

Sutherland Dows, vice president of the Tama & Toledo and vice president and general manager of the Cedar Rapids & Iowa City, has also been elected vice president and treasurer of the Wyoming Railway.

Purchases and Stores

J. C. Daniels has been appointed storekeeper of the Chesapeake & Ohio at Thurmond, succeeding **J. F. Light,** who has left the service.

The Burlington has made the following appointments: **J. K. McCann,** general piece work inspector at Chicago, succeeding **A. G. Swanson,** promoted; **J. W. Schwartz,** storekeeper at St. Joseph; **R. H. Johnson,** storekeeper at Alliance.

Traffic

C. H. Witt has been appointed general agent of the Big Four and the Evansville, Indianapolis & Terre Haute at Terre Haute.

Nathan W. Hawkes, freight traffic manager of the Canadian National and Central Vermont, has been elected vice president of the Boston & Maine in charge of traffic, succeeding **Gerritt Fort,** who has resigned to become president of the Raymond & Whitcomb Co. **Andrew F. Lane,** general agent at Pittsburgh, has been appointed Canadian agent, with headquarters at Montreal.

The Canadian National has made the following changes and appointments: **W. E. Watson,** superintendent of farm employment at Winnipeg; **T. P. Devlin,** district superintendent of colonization and agriculture, Saskatoon; **Dan M. Johnson,** European colonization manager at London, Eng., succeeding **G. M. Dix,** resigned; **J. S. McGowan,** western manager, colonization and agriculture at Winnipeg; **E. H. Gurton,** eastern superintendent of colonization and agriculture at Montreal.

T. H. Young has been appointed commercial agent for the Chesapeake & Ohio at Washington.

E. J. Schmidt, chief of the tariff bureau of the Chicago & Eastern Illinois at Chicago, has been appointed general coal agent with the same headquarters, succeeding **G. H. Kummer,** deceased.

F. A. Reid, manager and dispatcher of the motor freight system of the Pennsylvania in the Baltimore terminal territory, has been appointed general freight and passenger agent of the Chicago, Springfield & St. Louis and the Jacksonville & Havana, with headquarters at Springfield.

Harold L. Skeen has been appointed commercial agent for the Erie at San Francisco, succeeding **W. R. Crow,** retired.

T. A. Harahan has been appointed assistant coal freight agent of the Lehigh Valley with headquarters at New York.

The Missouri Pacific has made a number of important changes in its traffic department. **W. A. Rambach,** freight traffic manager, has been appointed assistant to C. E. Perkins, vice president in charge of traffic, and the duties of the office of freight traffic manager have been divided between **O. G. Parsley** and **D. R. Lincoln,** assistant freight traffic managers. Mr. Parsley is now freight traffic manager in charge of solicitation and Mr. Lincoln, freight traffic manager in charge of rates.

Mr. Rambach has spent his entire railroad career, 32 years, in the traffic department of the Missouri Pacific, and has been freight traffic manager eight years. Because of ill health, he has, at his own request, been relieved of the duties of freight traffic manager and assigned to the handling of special matters that may be referred to him by the traffic vice president. Mr. Parsley has had a wide experience in railroading. He went to the Missouri Pacific as assistant freight traffic manager in 1920. Mr. Lincoln has been with the company 34 years, and has served as assistant freight traffic manager since March 1, 1920.

Eugene Mock, general freight agent at St. Louis and **C. H. Hamilton,** general freight agent at Kansas City, have been appointed assistant freight traffic managers, Mr. Mock reporting to Mr. Parsley and Mr. Hamilton to Mr. Lincoln. **H. L. Traber,** general freight agent at Little Rock, has been appointed general freight agent at Kansas City, succeeding Mr. Hamilton. **H. R. Wilson,** assistant general freight agent at St. Louis, succeeds Mr. Traber at Little Rock. The freight traffic offices of the Missouri Pacific Lines in New York have been consolidated. **J. B. Trimble,** general agent of the Missouri Pacific freight department there, has been promoted to general eastern agent, Missouri Pacific Lines, with jurisdiction over the Gulf Coast Lines and the International-Great Northern. **C. E. Carlton,** general eastern agent for the latter two railroads, has been transferred to St. Louis as assistant general freight agent, Missouri Pacific Lines, reporting to Mr. Parsley at St. Louis and to freight traffic manager Guion at Houston. He will take over solicitation in St. Louis, which for several months has been in charge of **Clyde Hogsett,** who went to St. Louis from Kansas City because of the ill health of **George Kassling,** division freight agent at St. Louis. Mr. Kassling has been relieved of active duties and

W. A. Rambach.

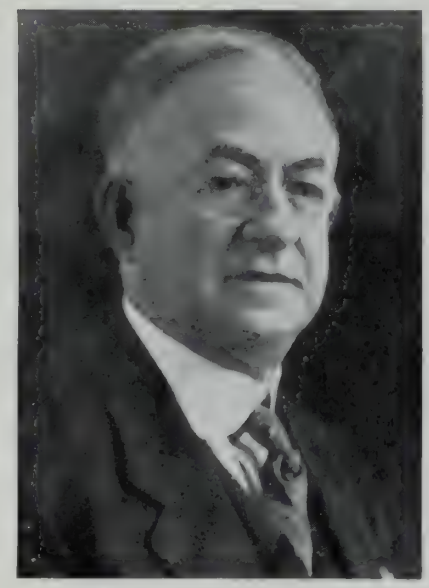
Mr. Hogsett has returned to his old at Kansas City. Other appointments are: **T. D. Moss,** assistant general passenger agent at Memphis, a newly created position; **J. M. Bryan,** general agent for the freight and passenger departments at Nashville, a newly established agency; **C. C. Hart,** general agent for the freight and passenger departments at Chattanooga, a newly established agency. **J. G. Carlisle, general** freight agent, has been appointed director of industrial development with headquarters at St. Louis.

Albert H. Seaver, general passenger agent of the New England Steamship Co., (a subsidiary of the New Haven) at New York, has been appointed assistant passenger traffic manager of the New Haven with headquarters at Boston, succeeding **E. L. Wilson,** deceased. **W. P. Read,** general passenger agent of the New Haven with headquarters at New Haven, has had his jurisdiction extended to include the New England Steamship Co. lines.

W. F. Watterson, division freight agent on the Nickel Plate at Buffalo, has been appointed assistant general freight agent with headquarters at the same point, the office of division freight agent having been abolished. **J. J. Wheatley** and **A. L. Gilmore,** district traffic agents of the Nickel Plate district at Cincinnati and Columbus, respectively, have been appointed general agents with the same headquarters with jurisdiction extended to cover the entire system. The jurisdiction of **J. E. Rheiner,** general agent of the Nickel Plate district at Toledo, has also been extended to cover the entire system.

C. A. Birge, vice president and general freight and passenger agent of the Oklahoma City-Ada-Atoka, has been appointed vice president and traffic manager, succeeding **H. G. Thompson,** resigned.

C. B. Sudborough, general traffic manager of the Pennsylvania, has been appointed assistant vice president in charge of traffic. Mr. Sudborough was born in St. Louis, November 1, 1876. He was educated in the public schools of St. Louis and in the manual training school department of Washington University, St. Louis. He entered railway service on September 1, 1897, as a clerk in the freight claim department of the Vandalia Railroad and later served as freight rate quotation clerk, bill-of-lading clerk, freight solicitor and chief rate clerk. He served for a short time as traffic manager of a large plaster manufacturing company, and on his return to railway service was again made chief rate clerk.



O. G. Parsley.

He was appointed division freight agent at St. Louis in 1909, assistant general freight agent in 1914, general freight agent in 1916, and with the merger of the Vandalia into the Panhandle, general freight agent of the southwest system of the Pittsburgh, Cincinnati, Chicago & St. Louis. Upon the termination of federal control of railroads and the adoption of the regional organization of the Pennsylvania System, Mr. Sudborough was appointed traffic manager of the southwestern region. He was appointed assistant general traffic manager of the system in January, 1925, and general traffic manager in August of the same year.

John B. Large, assistant general traffic manager, succeeds Mr. Sudborough as general traffic manager. Mr. Large was born in Philadelphia, August 18, 1882. He was educated at the Protestant Episcopal Academy of that city and at the University of Pennsylvania. He entered the service of the Pennsylvania on October 8, 1902, as clerk at Germantown Junction. The next year he was transferred to the rate room in the general office at Philadelphia. He held various positions in the freight department until his appointment, in 1915, as assistant general freight agent of the lines east of Pittsburgh and Erie. He became general freight agent in 1917, and upon the termination of federal control in 1920 was appointed traffic manager of the Pennsylvania system, at Philadelphia. He was appointed general traffic manager in 1925.

Other appointments are:

C. T. Mackenson, Jr., assistant general traffic manager at Philadelphia, in charge of merchandise and general freight traffic other than coal, succeeding Mr. Large; **J. T. Carbine,** assistant general traffic manager at Philadelphia in charge of general coal traffic; **C. H. Matthews, Jr.,** assistant general traffic manager with responsibility for general supervision over the passenger traffic of the system; **William R. Cox,** coal traffic manager of the central region at Pittsburgh, succeeding Mr. Carbine; **W. C. Glynn,** freight traffic manager on the eastern region at Philadelphia; **H. C. Oliver,** freight traffic manager of the central region at Pittsburgh; **William M. Pomeroy,** general freight agent of the central region; **R. H. Miller,** assistant general freight agent of the central region; **A. E. Buchanan,** general passenger agent of the eastern region; **W. A. Phillips,** assistant general passenger agent of the eastern region; **W. W. Richardson,** assistant to the passenger traffic manager of the western region at St. Louis; **F. A.**

D. R. Lincoln.

Bauchens, general passenger agent at St. Louis; **J. F. Hart,** division passenger agent at St. Louis; **J. B. McCorkle,** coal and ore agent at Cleveland; **Alan B. Smith,** division freight agent at Cleveland; **Stephen T. Stackpole,** general agent at Detroit, succeeding T. A. Roberts, deceased; **T. W. Preston,** general freight agent at Detroit; **C. D. Lechliter,** division freight agent at Detroit; **J. A. Sonnhalter,** division freight agent at Youngstown; **W. C. Sommers,** division freight agent at Wheeling; **W. T. Veit,** division freight agent at Baltimore; **W. S. Thomas,** division freight agent at Altoona. **J. S. Stewart,** who has been on special duty out of the office of the chief of freight transportation at Philadelphia, has been appointed supervising agent of the Indianapolis division.

J. A. Shields, district passenger agent of the Quebec Central at Boston, has been appointed general agent with headquarters at Sherbrooke, Que. Mr. Shields will also perform duties as may be assigned to him in connection with the claims department.

The Santa Fe has made the following appointments: **J. H. McCabe,** assistant freight traffic manager with headquarters at Chicago; **R. M. G. Merrick,** assistant freight traffic manager with headquarters at Topeka; **R. C. Nicholson,** general freight agent at Chicago, succeeding Mr. McCabe; **J. C. Burnett,** general freight agent at Topeka, succeeding Mr. Merrick; **C. E. Hattel,** assistant general freight agent at Chicago, succeeding Mr. Nicholson.

T. M. Dodd has been appointed perishable diversion agent of the Seaboard Air line with headquarters at Savannah.

Walter B. Wells, general agent for the St. Louis-San Francisco at Chicago, has been appointed assistant freight traffic manager in charge of on-line solicitation with headquarters at St. Louis. **Henry F. Sanborn,** assistant to the vice president in charge of traffic succeeds Mr. Wells as general agent at Chicago.

J. R. Bodenhamer has been appointed commercial agent for the St. Louis Southwestern at Pine Bluff.

A. C. Hedlund, formerly general agent, passenger department, of the Southern Pacific at Chicago has been appointed general agent, freight department, with the same headquarters. Mr. Hedlund possesses an enviable record, having served in various capacities since September 7, 1903. He was first employed as office messenger, advancing through the various clerkships to contracting freight agent, chief clerk, foreign freight agent and district passenger agent. He was made general agent, passenger department, March 1, 1926. Other appointments are: **Joseph H. Desherow,** general agent, passenger department, succeeding Mr. Hedlund; **Robert K. Smith,** general agent at Minneapolis, succeeding Mr. Desherow. **E. J. Fenchurch,** general freight and passenger agent at Tucson has been placed in charge of an office at Phoenix and will divide his time between the two points.

A. C. Hedlund.

C. B. Sudborough.

John B. Large.

W. P. Lambert has been appointed general agent of the Toledo, Peoria & Western at Shreveport, a newly created position.

The Union Pacific has made the following changes and appointments: **F. P. Stafford,** general agent, Des Moines; **C. B. Irwin,** special representative, traffic department at Cheyenne; **D. E. Clark,** general live stock agent, at Cheyenne. The position of general agent, freight department has been abolished. **S. C. Clarke,** general agent representing the operating and the traffic departments at Gering; **A. L. Ives,** general agent, passenger department at Seattle, succeeding **H. A. Lawrence,** promoted; **K. L. Handy,** passenger and freight traffic agent at Pomona.

R. H. Schultz, formerly assistant general freight agent of the International-Great Northern and the Gulf Coast Lines with headquarters at Houston, has been appointed traffic manager of the Wichita Falls & Southern with headquarters at Wichita Falls.

Mechanical

C. E. Brogdon, master mechanic of the Atlantic Coast Line at Moncrief, Jacksonville, has been transferred to Southover, Savannah, succeeding **J. W. Reams,** assigned to other duties. **George C. Jones,** general road foreman of engines at Jacksonville, succeeds Mr. Brogdon as master mechanic. The title of general road foreman of engines has been abolished.

G. P. Trachta, master mechanic of the Burlington at Omaha, has been appointed master mechanic of the Galesburg division at Galesburg, succeeding **J. S. Ford,** transferred.

Charles M. House, general car foreman of the Chicago & Alton at Bloomington, has been appointed superintendent of motive power and equipment with the same headquarters, succeeding **George W. Seidel,** who retired because of ill health.

The Missouri Pacific has made the following changes and appointments: **G. T. Callender**, master mechanic of the Eastern division at Jefferson City, succeeding **D. W. Cunningham**, resigned; **C. R. Kilbury**, master mechanic of the Omaha and Northern Kansas divisions at Falls City, succeeding Mr. Callender; **W. T. Abington**, master mechanic of the Southern Kansas division at Coffeyville, succeeding Mr. Kilbury.

W. W. Moore, assistant road foreman of engines of the Virginia division of the Seaboard Air Line at Raleigh, has been appointed supervisor of motor car operation. **W. W. Shoemaker** succeeds Mr. Moore as assistant road foreman of engines.

Charles F. Quincy.

H. H. Hummel has been appointed assistant to the general superintendent of motive power of the Southern Pacific with headquarters at San Francisco.

A. J. Poole has been appointed mechanical assistant of the Tennessee Central with headquarters at Nashville.

Civil

R. L. Sims, engineer maintenance of way of the Burlington at Lincoln, has been transferred to Alliance, succeeding **A. Chinn**, who has been transferred to Lincoln and placed in charge of work equipment.

D. C. Barrett, acting division engineer of the Minnesota division of the Chicago & North Western at Winona, has been appointed division engineer of the same division.

J. N. Olson has been appointed assistant valuation engineer of the Gulf, Colorado & Santa Fe at Galveston.

G. S. Smith, assistant engineer on the Missouri Pacific at Coffeyville, has been appointed division engineer of the Illinois division with headquarters at Bush.

The New York Central has made the following changes and appointments: **J. V. Neubert**, chief engineer maintenance of way; **W. A. Murray**, engineer maintenance of way, Buffalo and east, exterior zone, with headquarters at New York, succeeding Mr. Neubert; **G. N. Edmondson**, engineer of track, exterior zone, of the New York Central and the Ottawa & New York, with headquarters at New York; **A. R. Jones**, division engineer of the Mohawk division with headquarters at Albany; **S. A. Seely**, division engineer of the Pennsylvania division with headquarters at Jersey Shore; **J. N. Grim**, division engineer of the Adirondack & Ottawa divisions at Utica; **J. W. Stevens**, division engineer of the River division with headquarters at Weehawken; **J. H. Kelly**, division engineer of the Rochester division at Rochester; **C. A. Holden**, supervisor of buildings, west of Buffalo, with headquarters at Toledo, succeeding **E. J. Fraser**, who has been assigned to other duties on account of ill health; **C. E. Pettis**, assistant supervisor of buildings, at Toledo. **S. E. Armstrong**, division engineer of the River division, has been appointed engineer of standards, reporting to R. E. Dougherty. The jurisdiction of **J. F. McDonald**, office engineer, lines east of Buffalo, has been extended to cover the lines west and the Ohio Central lines.

C. M. Cannon, district engineer maintenance of way of the southern district of the Seaboard Air Line at Arcadia, has been appointed division engineer of the South Florida division, with the same headquarters, succeeding **G. C. Ruskell**, transferred.

A. L. Robinson has been appointed supervisor of bridges and buildings on the Stockton division of the Southern Pacific, succeeding **W. H. Burgess**, deceased.

R. A. Thompson, Jr., has been appointed chief engineer of the Wichita Falls & Southern, with headquarters at Wichita Falls.

Obituary

Charles H. Booth, assistant treasurer of the Delaware & Hudson at New York, died in that city October 20, following a brief illness.

H. L. Brown, secretary of the Ohio Brass Co., Mansfield, died October 23.

John DeWitt, supervisor of mail and express traffic of the Atlantic Coast Line at Wilmington, died at Wilmington, October 8.

J. W. Faessler, president of the J. Faessler Manufacturing Co., Moberly, died suddenly on September 22.

Paulino Fontes, former general director of the National Railways of Mexico, was executed, October 9, near Jalapa, V. C., with a party of his followers for his opposition to the regime of President Calles of Mexico.

Thomas A. Graham, former assistant freight traffic manager of the Southern Pacific, more recently connected with several steamship lines, died of influenza at Sydney, Australia, September 26.

E. O. Grundy, former general freight agent of the Quebec Central, died at Sherbrooke, October 17.

Charles F. Quincy, chairman of the board of the Q & C Co., New York, died October 1, at his summer home, Center Harbor, N. H., after a prolonged illness. Mr. Quincy was born in Newton, July 16, 1856. He was in the railroad supply business from 1886, first operating as the Dunham Manufacturing Co., and later as the Q & C Co., and was also connected with and active in several other enterprises. Mr. Quincy was also interested in forestry work and an ardent worker on behalf of boys.

Dr. Benjamin F. Lounsbury, chief surgeon for C. M. & St. P., and assistant professor of surgery at the University of Illinois, was killed in an automobile accident, October 21.

Harris C. Macklin, formerly purchasing agent for the Seaboard Air Line, for several years sales agent of the Railway Steel Spring Co., and the Southern Brass Co., Norfolk, died unexpectedly while playing golf at the Norfolk Country Club, October 8, aged 71.

S. Davies Warfield.

S. Davies Warfield, president of the Seaboard Air Line, died in Baltimore, October 24, following an operation for double hernia, aged 68.

George T. Jarvis, vice president of the Rutland, died in Rutland, October 19, aged 68.

Santa Fe Purchases Promote Prosperity

WHILE the Santa Fe is itself a large employer of labor—its payroll in 1926 totalled $107,000,000, and its employes number more than 75,000—indirectly as a buyer of materials and supplies it helps to furnish employment to many more. Such purchases last year exceeded $64,000,000. In addition it bought over $12,000,000 of new cars and locomotives.

Its largest class of material was fuel, which totalled $24,360,000. This consisted of about 2,267,000 tons of coal, and 507,800,000 gallons of fuel oil. The use of coal or oil on any division is determined primarily by which is the cheaper fuel in that locality.

The second largest class of purchases was iron and steel products, for which the expenditure was approximately $19,750,000. This included an expenditure of $9,500,000 for 152,700 tons of rail, frogs, switches, and fastenings. $1,500,000 went for wheels, axles, and tires and $306,000 for flues and tubes for locomotives. Bridges, turntables, structural steel, forgings, and fabricated, unfabricated, and pressed steel took nearly $3,000,000. Steel and iron are basic necessities in railroading.

Purchases of forest products totalled $6,412,000, which included over 3,000,000 cross ties, and large quantities of lumber and timbers. The Santa Fe creosotes its ties and much of its timbers, otherwise greater quantities would be needed each year.

Folders, report blanks, notices, tickets, tariffs, and various items in the stationery line required $1,225,000, electrical materials $660,000, lubricating oil and grease, illuminating oils, waste, etc., $1,180,000, and air brake material $617,600.

These purchases were necessary to maintain the railroad properly and to give satisfactory service to the public. They were covered by 130,000 invoices and were made from 3,347 individuals and firms. Note the wide spread of this buying.

Thus the Santa Fe and all railroads are an important factor in maintaining the prosperity of our country through the employment arising from these large purchases of supplies, as well as the millions directly disbursed among their own employes for services.

When the railroads are doing well, they buy materials and supplies on a larger scale than when net revenues fall off. Money thus spent mainly pays for the labor of many persons, helping merchants, farmers, everybody—your own community included. You therefore are vitally interested.

W. B. STOREY, *President*
The Atchison, Topeka and Santa Fe
Railway System.

Edward Turner Jeffery, former president and chairman of the board of the Denver & Rio Grande and the Western Pacific, who retired in 1917, died in New York, September 24, after three days' illness from heart disease.

George H. Kummer, general coal agent of the Chicago & Eastern Illinois at Chicago, died in that city, September 23.

John Arthur Robinson, auditor of the Cincinnati, New Orleans & Texas Pacific, with headquarters at Cincinnati, died in that city, September 21.

James M. Schoonmaker, chairman of the board of the Pittsburgh & Lake Erie, at Pittsburgh, died October 11 after an operation for appendicitis, aged 86.

Arthur Campbell Shaw, chief compiler of public time tables of the Canadian Pacific at Montreal, died in that city October 1.

Arthur C. Smith, vice president of the Morden Frog & Crossing Co., Chicago, died at Elmhurst, October 1, aged 56.

George Stanton, manager of sales of the Cleveland Frog & Crossing Co., died at his home at Cleveland, October 20.

Frank Deming Stout, president of the Missouri Southern, died of heart disease at a hospital at Rice Lake, October 11, following an illness of several months.

Festus J. Wade, president of the Mercantile Trust Co., St. Louis, died in that city, September 28, from pneumonia following an illness since August 9 when he underwent an operation for cancer of the throat. Mr. Wade was receiver of the Missouri & North Arkansas from 1916 to 1920, and also served during 1918 as a member of the advisory committee of the finance section of the division of finance and purchases of the United States Railroad Administration. At the time of his death, Mr. Wade was a director of the Chicago & Alton, the Big Four, and the St. Louis-San Francisco.

George E. Woodward, formerly general agent for the New Haven, died at his home in West Brookfield, Mass., October 12, aged 59.

C. Yoder, engineer maintenance of way of the New York Central, west of Buffalo, died September 28 at Cleveland, from heart disease.

Supply Trade Notes

Charles M. Schwab, chairman of the board of the Bethlehem Steel Corpn., has been elected president of the **American Iron & Steel Institute,** succeeding the late Elbert H. Gary. **James A. Farrell,** president of the United States Steel Corpn., has been elected vice president, and **Eugene J. Buffington,** president of the Illinois Steel Co., a director.

The **American Manganese Steel Co.,** Chicago, has purchased the foundry of the **American Brake Shoe & Foundry Co.,** at Burnside, and will continue operations in it until January 1, 1928.

A. K. Lewis, assistant to the vice president and general manager of the **American Rolling Mill Co.,** Middletown, has been appointed vice president in charge of operations of the **Columbia Steel Co., Butler,** which has been acquired by the former company.

Batchelder & Co., Chicago, have taken over the railroad sales of the **Klauer Manufacturing Co.,** Dubuque.

Horace Parker, of New York, president of the **Bradford Corpn.,** has been elected president and a director of **Edwin S. Woods & Co.,** Chicago.

A. H. Deimel has been appointed sales engineer of the **Buda Co.,** Harvey, in the eastern territory with headquarters in New York, succeeding **N. C. Study,** resigned.

William H. Hodge has been elected vice president of the **Byllesby Engineering & Management Corpn.,** and appointed a manager of a newly created sales and advertising department at its Chicago headquarters.

The **Chicago Pneumatic Tool Co.,** New York, announces the removal of its Cleveland district sales office from 1241 East 49th street to 1727 Union Trust building. **J. C. Fitzpatrick** has been appointed district manager of sales, succeeding **J. L. Westenhaver,** who has resigned to enter business for himself.

Frank H. Clark, formerly general superintendent of motive power of the Baltimore & Ohio, and, more recently, technical adviser to the Chinese ministry of communication, has opened an office as consulting engineer at 949 Broadway, New York.

William H. Croft, vice president and a director of the **Magnus Co., Inc.,** Chicago, has also been elected a director of the **National Lead Co.**

Otto H. Jorgensen has been appointed engineer, rail car department, of the **Cummings Car & Coach Co.** at its shops in Paris, Ill. Mr. Jorgensen was formerly assistant engineer of the Pullman Car & Manufacturing Co.

H. S. Peck, supervisor of locomotive and power plant operation of the C. M. & St. P., at Chicago, has been appointed sales representative of the **Edison Storage Battery Co.,** at Chicago.

W. M. Stearns has been transferred from the central station department of the **General Electric Co.** to the general commercial department, Schenectady, and has been appointed manager of special contracts. He will also act as assistant to J. G. Barry, vice president.

The **Graybar Electric Co.,** New York, has opened a new distributing house at Flint, Mich., with **H. W. Tincher** as sales manager, and another at Rochester with **J. A. Royce** as sales manager.

John F. Schurch, chairman of the board of **Manning, Maxwell & Moore, Inc.,** New York, has resigned.

The **Marion Steam Shovel Co.,** Marion, has established direct factory branches at Seattle and Portland. **C. H. Allen** is in charge of the former and **H. L. Niles** of the latter.

H. B. Wilson has been appointed southwestern sales manager of the railroad division of the **Morton Manufacturing Co.,** with headquarters at 915 Olive street, St. Louis.

Lewis K. Sillcox, formerly general superintendent of motive power of the C. M. & St. P., has been appointed assistant to the president of the **New York Air Brake Co.,** with headquarters at New York.

William S. Miller, manager of the railway department of the **Parsons Co.,** Newton, has resigned to become manager of railroad sales for the **Northwest Engineering Co.,** Chicago.

The **Standard Coupler Co.,** New York, has moved its offices from 110 East 42nd street to 420 Lexington avenue.

The **West Coast Lumber Trade Extension Bureau** announces the removal of the general offices from 562 Stuart building, Seattle, to Longview. A district office will be maintained in Seattle at 5505 Henry building in charge of **J. R. Blunt,** and a district office will be opened soon in Portland.

E. J. Stocking, secretary of the **American Wood Preservers' Association,** has been appointed general sales manager of the **Western Tie & Timber Co.,** and the **Kettle River Treating Co.,** with headquarters at St. Louis, succeeding **R. A. Calvin,** resigned. Mr. Stocking will continue to perform the duties of secretary of the Wood Preservers' Association until January 1.

E. O. Bittner has been appointed manger of the Wichita branch of the **White Company,** succeeding **W. C. Pahlman,** who has been appointed manager at Oklahoma.

JORDAN SPREADER

"Does the Work of an Army of Men"

SNOW PLOW ★ ICE CUTTER ★ DITCHER

UNIVERSALLY STANDARD

O. F. JORDAN COMPANY

WALTER J. RILEY, PRESIDENT

EAST CHICAGO, INDIANA

Jordan-ize

Your ditch forming
material spreading
earth moving
ice cutting
snow fighting

and

Economize!

JORDANS aid proper drainage

Save time! *Save money!*

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

For detailed description see Car Builders Cyclopedia

CLARK CAR COMPANY

BALANCED DOOR DUMP CAR

PITTSBURGH, PA.

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Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.

COLUMBUS, OHIO

Freight Car lading is costly. There is more of it being hauled by railroads today than ever before—

Cars are costly too—

Both are being moved more rapidly and in heavier trains than ever before—

Do not these facts sufficiently emphasize the greater need for

PROTECTION—

FOR CARS AND LADING?

SESSIONS - STANDARD
PROTECTION
FOR CARS AND LADING

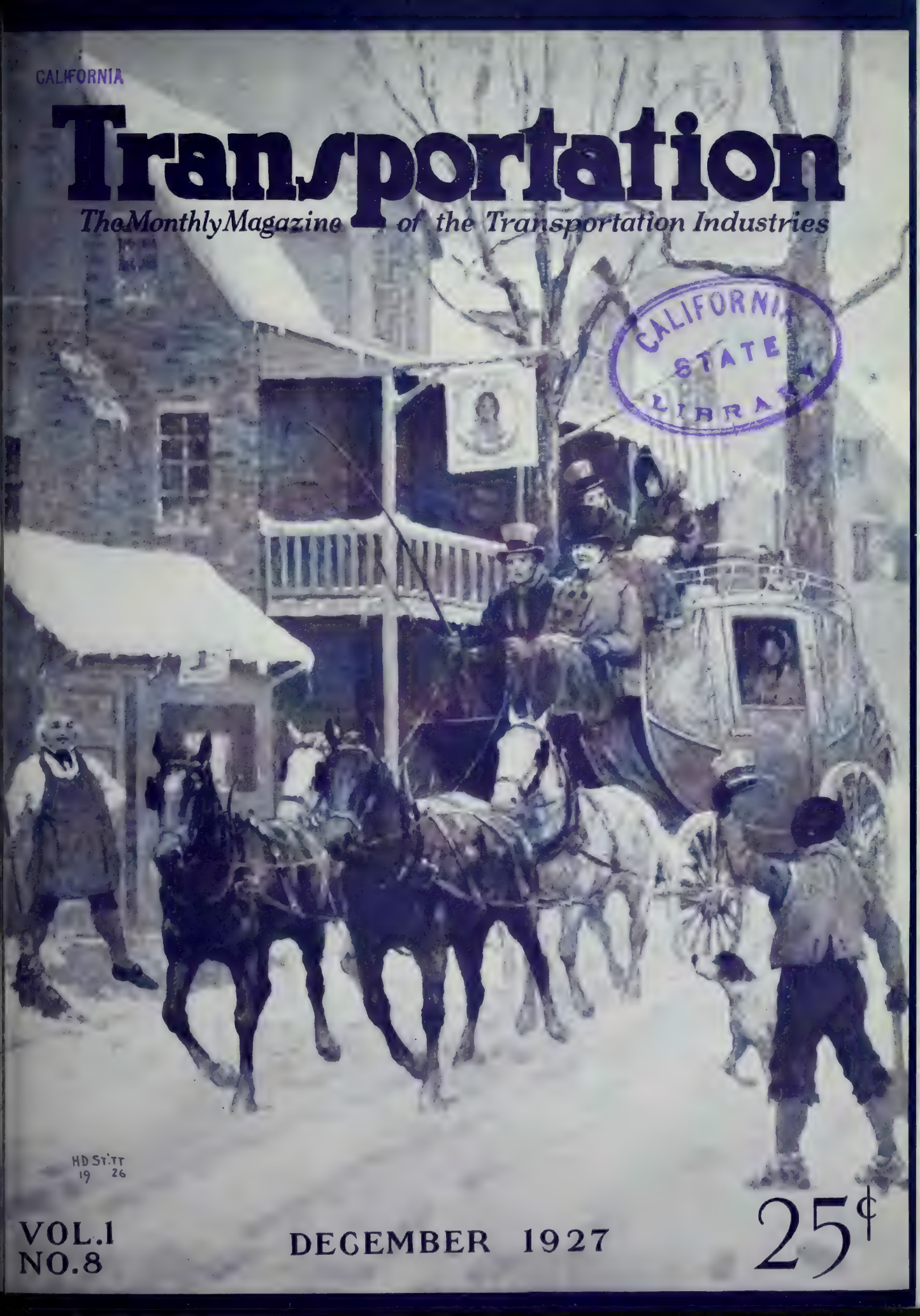
STANDARD COUPLER CO.

NEW YORK CHICAGO

CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industries



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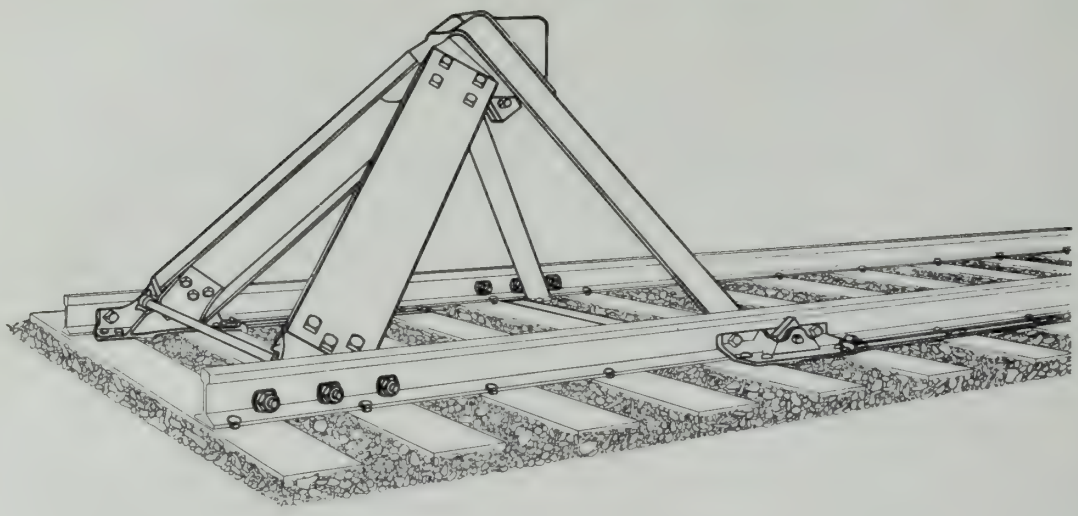
VOL. I
NO. 8

DECEMBER 1927

25¢

Some astonishing statements



A bumping post user to whom Type W was recently explained said to our man that he was making "some astonishing statements". But when you come to analyze the post are these statements so hard to believe?

1 "One size fits any rail from four to seven inches high." The only parts of the post which touch the track rails are the tension and compression joints and these are specially designed to fit this wide range of rail sections.

2 "All bolts are in simple shear only; none are subjected to any combination of shear and tension or bend." Examine the drawings and you will verify this.

3 "There are only 12 holes to drill in the track rails and these are for one inch bolts." Reference to any illustration of the post will show this to be a fact.

4 "Installation is simple and inexpensive. A two-man gang can do the job. The heaviest part or combination of parts to be lifted weighs 215 pounds." Prove this when you put the post in. Follow the simple directions literally and see how readily the post is installed.

5 "Type W does its work with little or no damage to the post or the cars. It is attached to the track rails and also direct to eight cross ties. The resistance of these ties with the ballast around them provides a cushioned stop." Select a severe location for a post and then examine it frequently and you will convince yourself of the truth of these statements the same as hundreds of others have done.

6 "The post gives remarkable car-stopping service." This is another fact which you can only prove to yourself by watching the post in track.

7 "A Type W is usually not damaged when knocked out. We have never found a case where more than 40% of its cost need be spent to put it back in good condition." This is where the post shines. A Type W has never been destroyed and put in scrap.

There are now more than 1200 of these posts in track put in during the past three years.

We ship the same day we get your order. We carry a large stock of finished posts which shows that our experience has given us unlimited confidence in the future of Type W.

Hayes Track Appliance Co., Richmond, Indiana

You Can't See the Weld— Because There Isn't Any!

WHILE welding serves many useful purposes, a welded joint in a brake beam hanger is a weak spot—a source of inevitable failure.

Schaefer Loop Hanger has no weld. It is entirely of one-piece construction—drop forged from special wear-resisting steel, heat treated and oil-quenched. Furthermore, it is so designed that the section of the cross members is 50% heavier, providing reinforcement and additional safety at the bends.

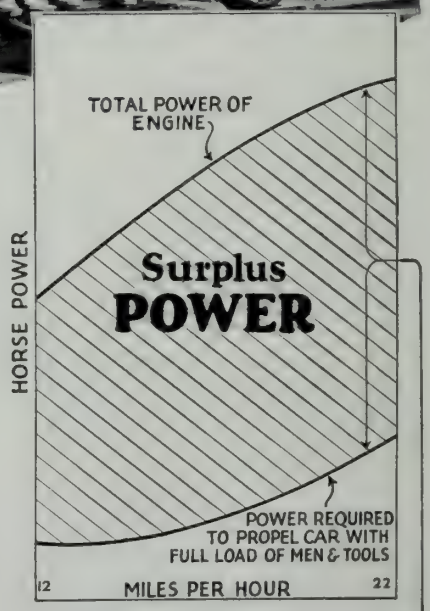
Weldless construction, heat-treated and oil-quenched for additional strength, reinforced at the bends for greater dependability—these are only a few of the exclusive advantages which make Schaefer Loop Brake Beam Hangers last the life of the car. Write for bulletin illustrating other features.

Fairmont POWER

Always In Reserve

Emergencies are the test of railway motor cars. Wrecks, wash-outs, or jobs calling for rush handling of heavy materials like rails, switch points, and the handling of men and tools, comprise these "unforeseen" conditions which occur on every railroad and which should be thoroughly considered in the purchase of railway motor cars. Large reserve drawbar horse power is invaluable in emergencies.

FAIRMONT cars are universally adopted because of their universal and more economical adaptability for both routine and emergency work.



The Drawbar Horse Power or SURPLUS POWER of a motor car at any given speed is the power exerted at the drawbar over and above what is required to propel the car when loaded with its normal rated load.

FAIRMONT RAILWAY MOTORS, Inc.
FAIRMONT, MINNESOTA

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BALDWIN LOCOMOTIVE WORKS
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Section Motor Cars A2—M2—S2—M14
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Push Cars and Trailers T1—T2—T3—T20—T2.
Gang and Power Cars AT2—MT2—ST2
Weed Burners C(M27)—B(M27)
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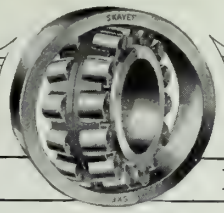
Improved Wheels and Axles
Power Track Cranes **Safety Appliances**

SKF Journal Bearings are basically better than plain bearings



Journal Bearings

Let the Axle Have Its Way

SKF *Journal Bearings Never Bind*

NO bearing can afford to argue with an axle. It must be permitted to take any position with respect to the pedestals that it sees fit.

That is why SKF journal bearings are made completely flexible in their mounting in a sense that is true of no other railroad anti-friction bearing.

Free, universal movement within the bearing avoids the constraint which affects other bearings under the varying movement of the axle, thereby causing heating.

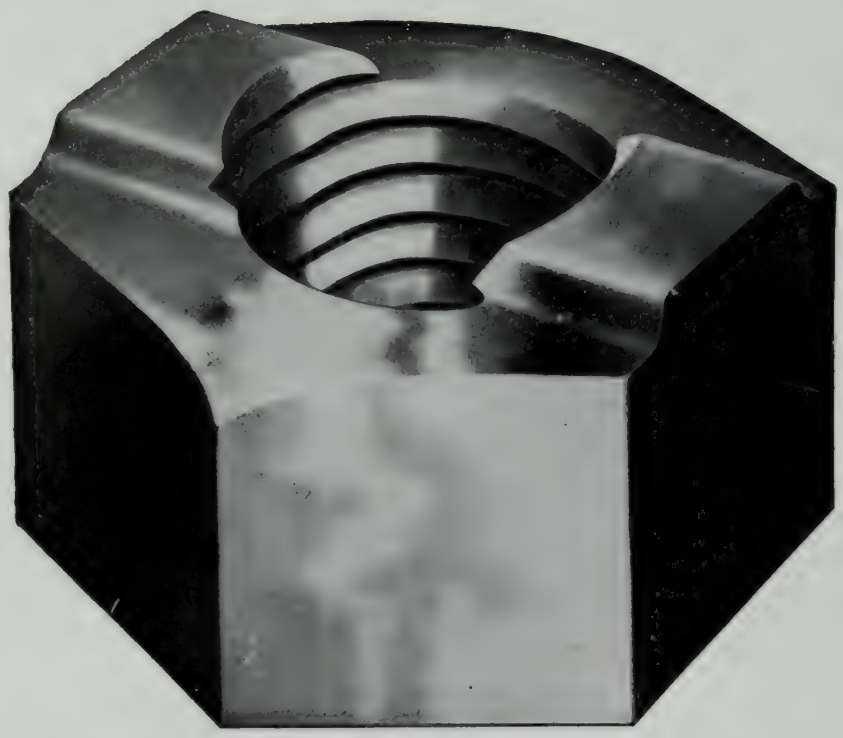
Because of its flexibility, the SKF journal bearing has the lowest friction of any railroad anti-friction journal bearing.

SKF INDUSTRIES, INCORPORATED, 40 East 34th St., New York City

1856

More than 100 Factory Offices Throughout the World

HERE'S A NUT



A nut is more than just a piece of steel with a hole punched through it. Made right, it's a device for holding bolted parts together.

Grip Nut's locking principle is correct. Its positive, automatic lock is created when it's manufactured; it doesn't depend upon skillful application. So, when you apply a Grip Nut, you know that every bit of its one hundred percent A. R. A. Standard thread, from uniform crest to full-depth root, is doing its part—maintaining Grip Nut's twenty-one-years reputation for holding.

Apply a Grip Nut; it's the biggest nut's worth of holding power ever put on a bolt.

GRIP NUT COMPANY
5917 South Western Avenue
CHICAGO

Transportation

The Monthly Magazine of the Transportation Industries

DECEMBER, 1927

VOLUME ONE NUMBER EIGHT

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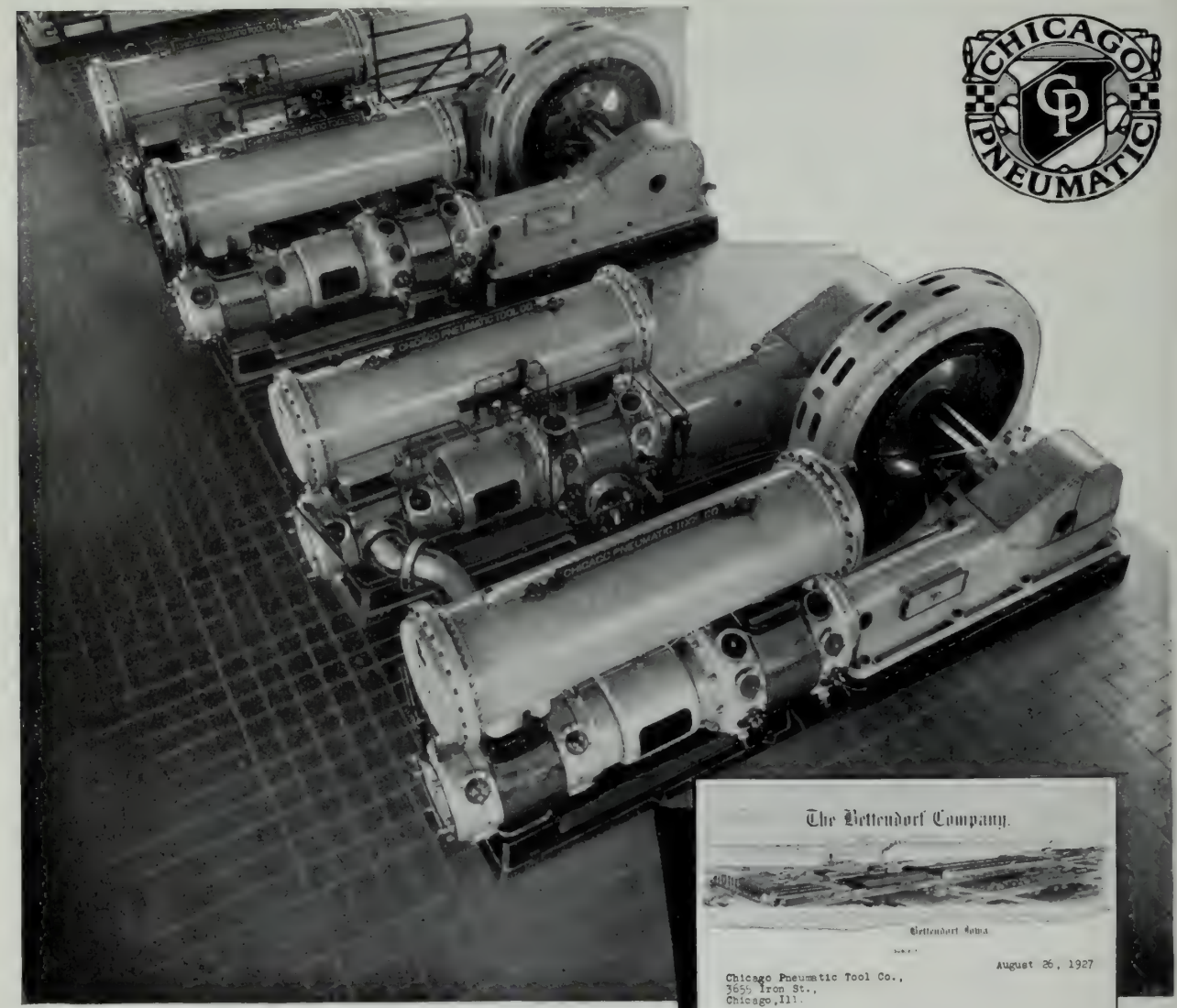
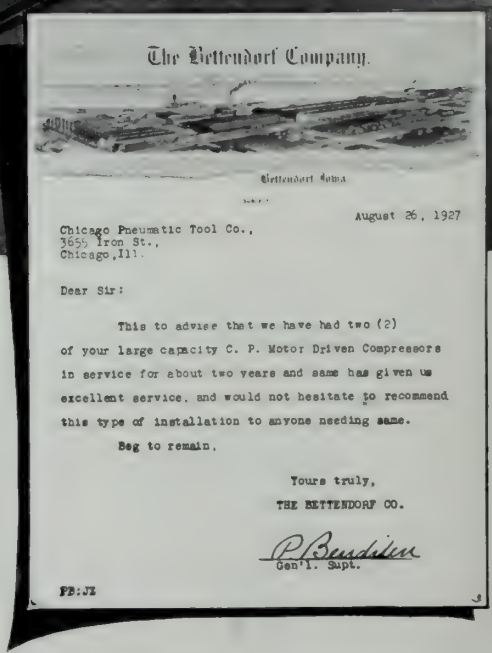


Two CP Synchronous Motor Driven Compressors, tandem duplex type, in the power plant of The Bettendorf Co., Bettendorf, Iowa.



The Bettendorf Company.

Bettendorf, Iowa

August 26, 1927

Chicago Pneumatic Tool Co.,
3655 Iron St.,
Chicago, Ill.

Dear Sir:

This to advise that we have had two (2) of your large capacity C. P. Motor Driven Compressors in service for about two years and same has given us excellent service, and would not hesitate to recommend this type of installation to anyone needing same.

Beg to remain,

Yours truly,
THE BETTENDORF CO.

P. Bendiksen
Gen'l. Supt.

FB:JZ

THESE CP compressors furnish air for the entire plant of one of the world's largest railroad car builders—21 acres under roof and 1½ miles long. They have been in constant service since installed and have given no trouble of any kind. This is indicative of the performance that may be expected of all CP products.

Literature on Air Compressors of any type sent gladly on request

Chicago Pneumatic Tool Co.

Sales and Service Branches All Over the World

6 East 44th Street New York, N. Y.

Advantages of this type of installation

1—Either side can be operated alone, giving half capacity at full load economy.
2—Perfect balance, since the pistons of both sides are the same size and weight and subjected to the same total pressures.
3—Cylinders and pistons are smaller and lighter and have the advantage of a tail rod without actually using one. Smaller cylinders mean better cooling; smaller and lighter pistons mean less cylinder wear.
4—Five-step Capacity Regulation—simplest and most efficient known.
5—Long split tandem piece affords complete access to both cylinders.

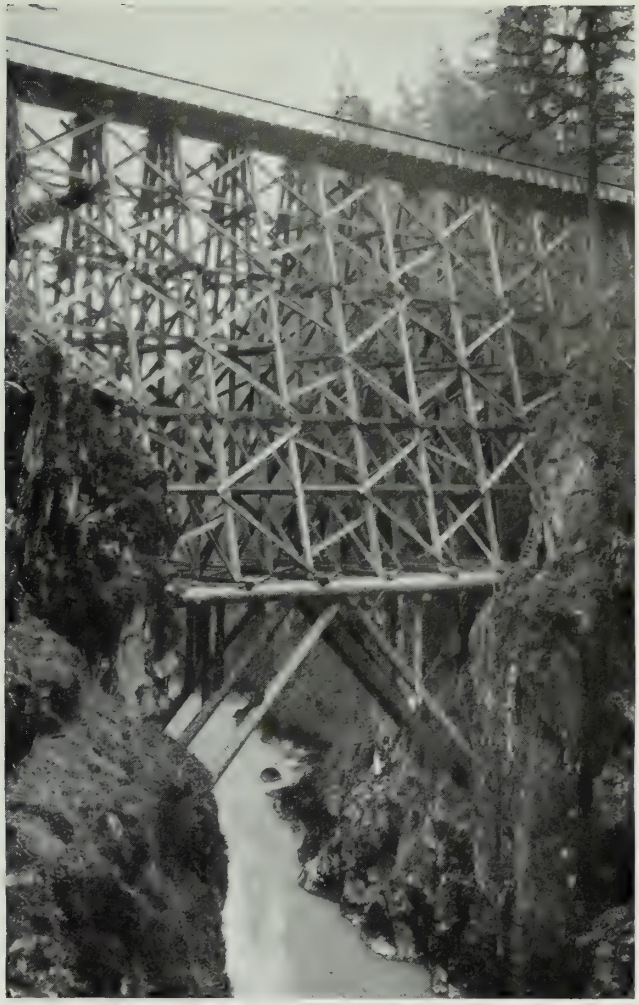
C-275

A Short Line Financed By Four Great Western Roads

A Project in Washington State

By

W. E. Brown



The Cowlitz River Bridge.

THE Cowlitz, Chehalis & Cascade is now constructing the first unit, between Lacamas and Cowlitz, Washington, of an extension to be 16 miles long. This unit taps a virgin forest of Douglas fir and West Coast cedar sufficient to supply traffic to the railway for 50 years. The extension is unique too in that it is being financed by four transcontinental railways.

The Cowlitz, Chehalis & Cascade is an independent short line railway giving entrance for the Chicago, Milwaukee & St. Paul, the Great Northern, the Northern Pacific, and the Union Pacific into the developing resources of eastern Lewis county. It extends southeasterly from Chehalis, Washington, through the fertile and highly developed Newaukum Valley, crosses a divide 18 miles from Chehalis, and dips into the valley of the Cowlitz River, terminating at Lacamas.

The extension will be completed January 1. It crosses the Cowlitz River eight miles beyond the present terminus near the mouth of Winston Creek at an elevation of 150 feet above the stream. The line then follows the Winston Creek Valley, emerging into a broad valley at the boundary of a highly developed area of farm land known as the Klickatat Prairie, which was never timbered, formerly the home of the Klickatat Indians. Fine farm houses and extensively cultivated fields lie along the national park highway, which runs through this fertile valley.

A vast body of virgin forest joins the Klickatat Prairie, lying to the west where the extension crosses the Cowlitz River, and reaches the timber line eastwardly near the crest of the Cascade Mountains. Between the Cowlitz River and the foothills of the mountains, a distance of 70 miles, lies the largest body of sawmill timber in the state of Washington, providing all grades of lumber and large timbers, principally Douglas fir and cedar of an especially fine quality, reliably estimated at 34,000,000,000 board feet. Much of it can be reached only by the projected lines of the Cowlitz, Chehalis & Cascade Ry.

As the line begins to climb the elevation to the Cascade Mountains there are great stands of cottonwood, alder, larch and other woods especially cut for the manufacture of pulp wood and fine grades of paper.

The railroad was chartered in 1916 and placed in operation July 1, 1918. It was projected for the purpose of developing the vast natural resources of eastern Lewis

county, which is without railroad facilities except for this line and a branch of the Chicago, Milwaukee & St. Paul between Park Junction and Morton. The first 15 miles of the old line passes through the beautiful Newaukum Valley where every acre is under intense development, principally in dairy and poultry ranches. A large percentage of the milk which supplies the two great condensing plants at Chehalis originates along this line. The Washington Cooperative Egg & Poultry Concern, which is now second in volume of shipments to the Petaluma, Cal., district, shares in the egg and poultry production from this territory, and has a large assembling warehouse at Centralia, Washington, and is considering a second one on the extension of this line, the headquarters being at Winlock, in Lewis county.

The Onalaska Lumber Company, owned by the Carlisle Lumber interests at Onalaska, Washington, uses the Cowlitz, Chehalis & Cascade Ry. for the shipment of part of its products to points on the Chicago, Milwaukee & St. Paul Ry. The company has an independently operated common carrier of its own from its mill to the jointly operated lines at Napavine, Washington. A large cross arm factory at Chehalis receives much of its raw material from the sawmills along the Cowlitz, Chehalis & Cascade Ry. The Gordon VanTine Manufacturing Co. of Davenport, Iowa, has one of its largest plants at Chehalis which draws a portion of its supplies from the sawmills along this line also. There are other wood working and furniture plants at Chehalis which depend upon the source of supply from eastern Lewis county, over the short line. Between Chehalis and Cowlitz River are several sawmills, some of them of major production, where towns have been established.

Between Chehalis and Divide the line is advantageously located with a maximum gradient of 1 per cent. Beyond, crossing the Cowlitz River drainage the quantities are very heavy and a major per cent of rock. A maximum 1 per cent gradient is maintained on the whole line, both the old road and the extension. Both the old line and the extension are well ballasted, and the cuts are well drained, and laid with 75 and 85-pound rail. The existing line crosses the Newaukum River three times by means of standard Howe trusses designed according to Cooper's E-40 loading for wooden bridges. Near Salkum, the extension crosses Mill Creek, which flows through a deep narrow gorge, by means of a trestle 1227 feet in length, 85 feet above the water line at the stream, containing 432,000 board feet of timbers.

Pulpwood on Both Sides of Bridge Spanning Mill Creek Canyon. This Bridge Is 2640 Feet Long.

The Backus - Brooks Co. of Minneapolis, Minn., one of the largest manufacturers of paper in the country, operating very extensively in Minnesota and Canada, has secured a permit from the supervisor of hydraulics of the state of Washington to make necessary investigations of hydro-electric power possibilities, and the feasibility of constructing dams in the Cowlitz River. Associated with the Backus Brooks interests is the Federal Light & Traction Co. of New York, operating light and power plants in several states and also in Canada. This company owns the public utilities, light and power on Grays Harbor, Wash., where the Zellerbach interests, large manufacturers of paper, are constructing a huge mill. The power company has acquired the necessary flowage lands along the river which would be flooded by the construction of dams.

The project involves the construction of three dams, varying from 300 feet in height to 136 feet in height, the latter situated near the point where the Cowlitz, Chehalis & Cascade Ry. crosses the Cowlitz River; the second dam at Dunn's Canyon, 20 miles above, and the third at the mouth of the Cispus River where it empties into the Cowlitz in the National Forest Reserve 37 miles above the first dam at Mayfield. The first two dams are intended for the development of hydro-electric power, and

the third for water storage. As the Cowlitz River has its source in a glacier on the side of Mt. Rainier, it carries a dependable volume of water continuously during all seasons of the year.

Engineering investigations indicate that 147,000 h.p. hydro-electric power can be developed by this project. This power will be used not only along the line of the Cowlitz, Chehalis & Cascade, but will be carried by transmission lines to the cities of Aberdeen, Hoquiam and Montesano on Grays Harbor, and to cities on Puget Sound.

The construction of these three dams raises the water level in the Cowlitz River and controls the current lending itself ideally to development of navigation. It is planned to log great areas of timber on the upper reaches of the Cispus, Cowlitz and Tilton Rivers into these streams and transport the logs into extensive booming grounds near the first dam at the dam site at Mayfield, or where the railroad crosses the Cowlitz River, and establish large sawmills to manufacture these logs for shipment over the railroad. This provides cheap water transportation for logs superior to rail transportation and more economical, and as there are thousands of acres of timber along these streams in the broken up rough areas which would necessitate expensive logging - railroad construction this is an economical way of taking the raw material to the sawmills.

The equipment of the railway consists of five steam locomotives, 104 freight cars, two gasoline propelled passenger cars and considerable construction machinery. Included in the railroad's equipment are 78 specially designed logging cars of the patent bunk type used to transport logs to the lumber mills at Chehalis and along the line. As practically all of the business originating on this line, except logs to Chehalis, is highly competitive long haul traffic the railroad has no difficulty in securing box, gondola, flat and other type of equipment to supply mills and other industries on its line from the four transcontinental railways which are very anxious to participate in the transcontinental business.

This Fallen Monarch Was 211 Years Old When Cut. It Stood 230 Feet in Height.

Radio To Operate Trains

The operation of trains by radio was forecast by the late Admiral Bullard, chairman of the federal radio commission, in addressing the telegraph and telephone section of the A. R. A., in Washington.

"Twelve years ago," said the admiral, "I was approached by one of the big western railroads and asked to develop a scheme by which radio might be used for controlling trains. The officers had the idea of controlling their dispatching, and communication between their long freight trains, by means of radio.

"After a long study of the subject, I gave a report at that time that it was an impractical proposition and recommended strongly against it. Eighteen months later a gentleman representing that organization told me that my thoughts and recommendations at that time had saved them thousands of dollars. Now, however, the state of the art renders it a perfectly feasible proposition to install and operate these new devices. You must remember, however, that every time one of these little waves goes out it fills up and clutters the air. Now, if we had all the railroads of the United States operating what we call mobile stations the whole atmosphere would be jammed full of these wave lengths, and it would be an extremely difficult proposition for the radio commission, which has control over licensing those things, to keep them all separated.

"So I would give a little word of warning here that possibly you might use some other means, having in mind exactly what you want in the way of controlling the trains, the dispatching, and all that sort of thing.

"Sixteen prominent railroads in the United States, have for their own exclusive use and do use 158,-

A Few Big Sticks Loaded for Shipment Over the Cowlitz, Chehalis & Cascade Ry.

964 miles of telegraph wire. Similarly these same railroads use over 335,000 miles of telephone wire. Here is a chance along your own line of developing a radio system of your own that could not be approached in any other way through the application of what is known as the wired wireless. You can use these telephone lines with one transmitter, and with the wired wireless feed that into every station along the line or any other place you wanted to put it.

"Now here comes a new industry that I think will be coming—whether you think so or not, I think you will do it—somebody will make this experiment of trying to control and operate their trains by radio; and in these days it is a perfectly simple and practicable proposition, with very little capital expenditure involved.

"The question of communication between the two ends of long freight trains going over mountains and around curves in thick, misty weather, whereby the men in the locomotive and the man in the caboose could be in constant communication with one another, is quite an independent one from the one I spoke of a few minutes ago, the application of wired wireless over present existing lines. Such a scheme, if put into effect for a train, would be a brand new proposition, and I should like to see it done. I am not throwing any bricks on it, either. I am only cautioning you that if everybody does it, you probably would not be as friendly as you are now, because you will all want different wave lengths, and we shall be up against it just the same; but we shall try to treat you all alike.

"In case this train dispatching proposition grew to any proportions, stations and railroads would have to divide time. That is, if a railroad system in the East were given a certain definite allocation of wave lengths to conduct its experiments at the beginning, and afterward there should be demonstrations, possibly another railroad system in the central part of the state or at the extreme western end, in order to conserve these wavelengths, would have to divide time with it; and with the use of short, low power, it is not conceivable that they would interfere with each other.

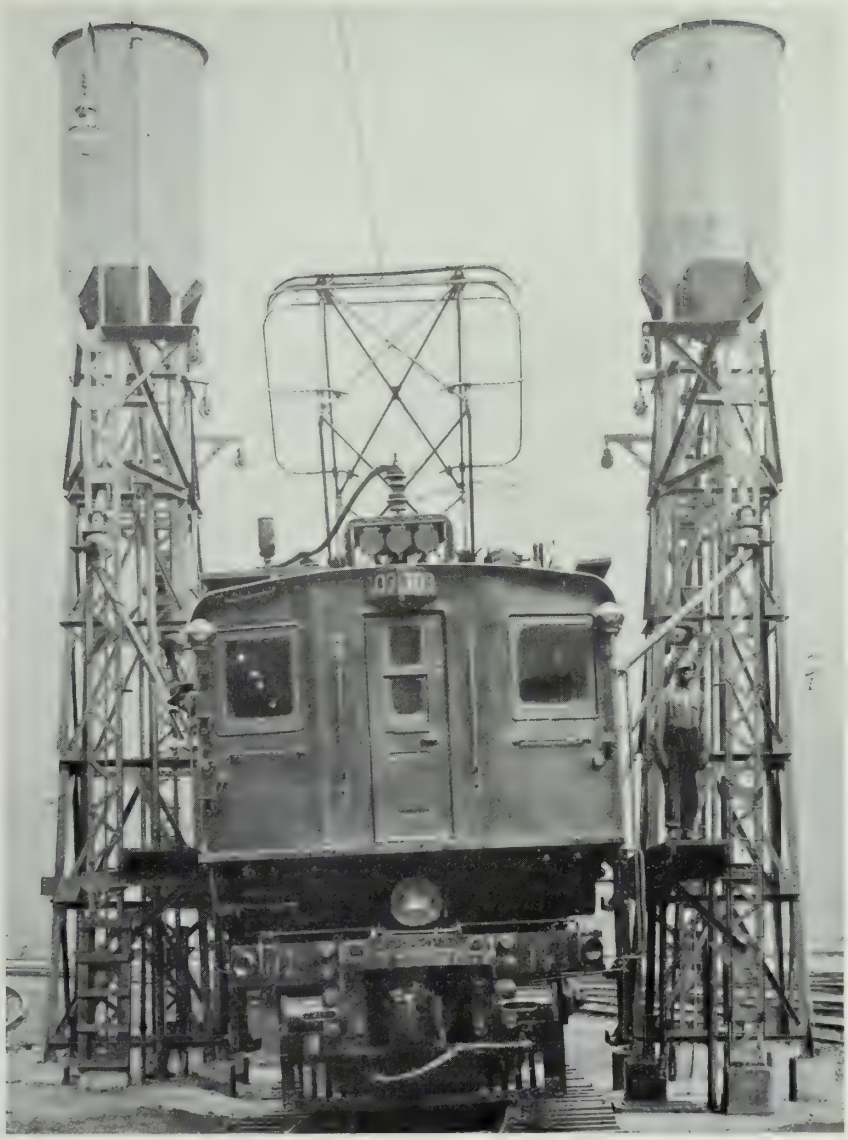
"It is my province in life to try to point out all the obstacles to be overcome before people go into development. There are not many hurdles to be jumped on this proposition of train dispatching.

"The radio commission is concerned in granting licenses to people, under the wording of the law 'in the public interest, necessity and convenience.' It seems to me the dispatching and operating of trains is in the public interest, especially moving trains. My thought is that radio has a part in the world in the control and communication with moving objects where it is impossible, of course, to have direct physical, metallic contact. I regard a moving train as a place where there are no existing communications except visual ones, such as block signals.

"I can see very great good in this matter of radio-controlled trains; and if I were the president of a big railroad, I should get the people hustling to beat the band to get in on this game, at least for a trial."

Maintaining An Electric Locomotive on the Virginian Railway

By Allen McLanahan



The Sanding Towers Provide for Completely Sanding One Unit Without Movement.

A MODERN plant for repairing and maintaining its electric locomotives has been built by the Virginian Railway at Mullens, W. Va. This is one of the very few plants in the country erected especially for the purpose and was decided upon by the company in connection with its electrification of 134 miles of track from Mullens to Roanoke, Va.

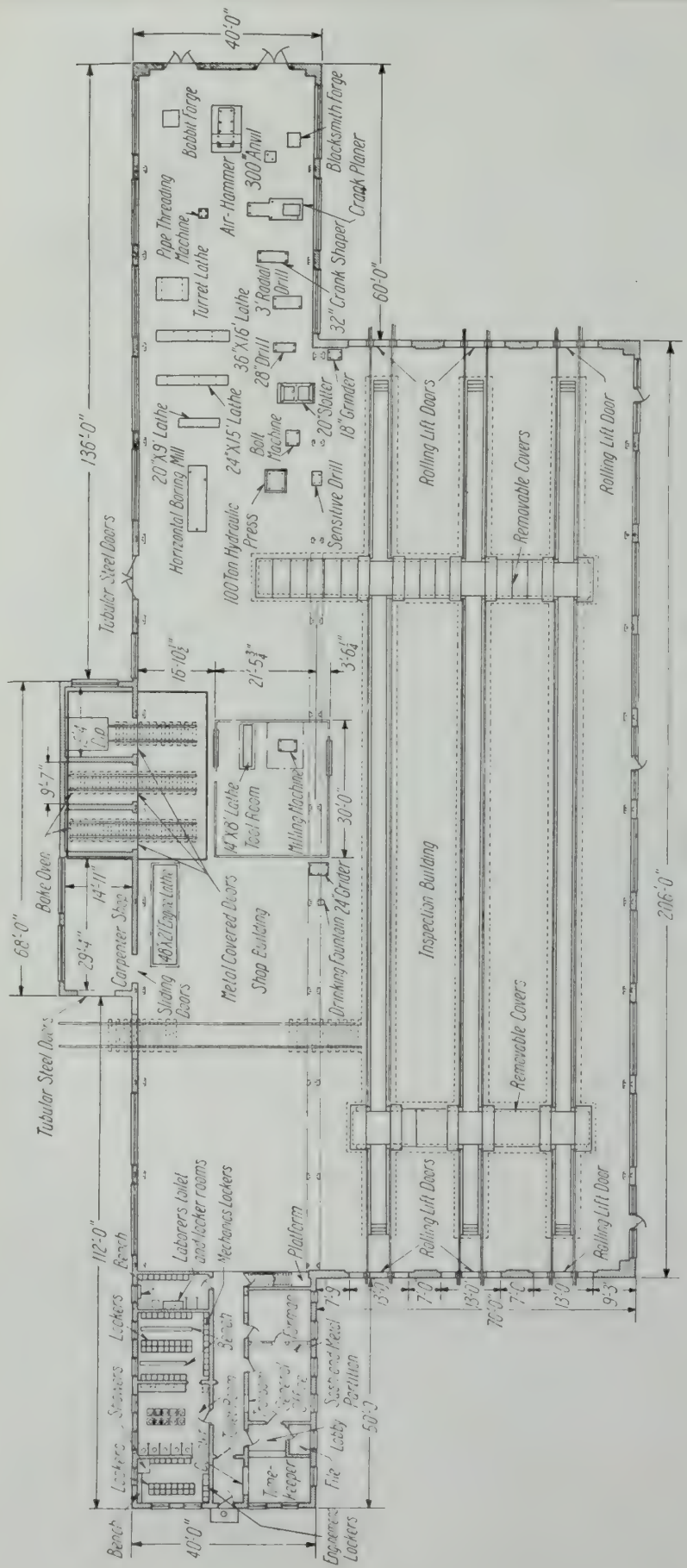
The Virginian electrification project, costing 15 million dollars, was awarded to the Westinghouse Company in 1923. It included 36 motive power units of 215 tons each. Normally three units comprise a locomotive, so that shop facilities had to be provided to care for locomotives measuring over 150 ft. in length.

In considering the proper location for the electric shop it was decided it should be not only the repair point, but as far as possible should be the turning point for all locomotives. Since the service requires that certain locomotives operate only at the western end of the electrification on Clark's Gap Hill, the shop was located at Mullens, which is the western end of the electrified zone. All engines now operate out of Mullens, and the necessity of maintaining a stock of spare parts at several points is eliminated. With this location the only additional shop facilities required are those for making the inspection and running repairs to locomotives at Roanoke after their eastbound trip.

The plant includes the shop proper, a storehouse, an oil house, a building for the substation and steam heating boiler, a water tank, sanding towers, an outside inspection pit, and locomotive storage tracks. As all the tracks outside the shop are electrified, there is no need for a steam locomotive to move the electric locomotives.

On arrival from the road a locomotive passes between the sand towers, where the sand boxes and rheostat fresh water tanks are filled and the running gear washed. After this is completed it is moved on the same track to the inspection pit, where it receives a complete mechanical and electrical inspection. The trolley wire over this pit is equipped with a disconnect-

Mr. McLanahan, author of the accompanying article, is a service engineer for the Westinghouse Electric & Mfg. Co.



Plan of Layout of Inspection Building.

ing and grounding switch so that the inspection of the pantagraphs and roofs can be made in perfect safety. After inspection the locomotive is put on one of the storage tracks until it is again called. If repairs are to be made, the locomotive is pushed into the shop by another electric locomotive.

The water for shop purposes and for use in the liquid rheostats is obtained from a well under the substation building. A deep well pump supplies this water to the 125,000-gallon storage tank from which it is piped to the shop and yard. For fire protection a motor driven fire pump supplies water at high pressure to a pipe line to which fire hydrants are connected at convenient points in the shop yard.

The main shop building has two bays and one wing which contains the carpenter shop, bake oven and dip tank.

The first bay or inspection building is 206 feet long and 70 feet wide and contains three pit tracks, long enough to take care of a complete locomotive. These pits have a jacking shelf and are equipped with permanent lights as well as receptacles for portable lamps, and are piped for compressed air. There is a drop pit near each end of these tracks so that six points have been provided for dropping wheels and engine trucks. The drop pits are equipped with portable hydraulic jacks. This bay is served by a 30-ton electric crane. A gallery has been provided along the outside track at the height of a locomotive roof for use in connection with pantagraph or other roof work.

The second bay contains the tool room, air brake room, machine and blacksmith shops, winding room, electrical repair spaces, locker and washrooms and the offices. This bay is served by a 15-ton electric crane, operated from the floor.

The floor of the whole shop consists of two inch treated oak planks laid on sills set in crusher

dust. The shop is heated by an indirect system of unit heaters, each unit consisting of a steam radiator, electric blower fan and air piping. The ceiling is painted white and an ample provision of lights results in excellent illumination at night in all parts of the shop.

The whole shop is piped for compressed air and outlets are placed at convenient points for connecting portable lamps, the insulation testing outfit, and a Westinghouse portable arc welding set. In addition there is a 32-volt a-c. circuit, by means of which current can be supplied to the locomotive lights without using the batteries or energizing the locomotive. This arrangement is of great assistance in working inside the locomotive cabs as it obviates the necessity of taking portables into the cabs.

The machine shop contains the following machine tools, all of which have individual motor drive:

84 in. engine lathe
30 in. engine lathe
24 in. engine lathe
18 in. engine lathe
60 in. universal (horizontal) boring mill
48 in. vertical turret lathe
30 in. crank planer with 40 in. stroke
40 in. shaper
slotter with 26 in. stroke
36 in. radial drill press
28 in. vertical drill press
18 in. vertical drill press
Bolt Machine
4 in. Pipe cutting machine

In addition there are two electric grinders, a 100-ton air operated bushing press and hand operated sheet metal shears, roller and crimper. No tire turning equipment or wheel press has been installed as it is intended this work shall be done in the Princeton shops.

The 84-in. lathe is used for banding the large traction motor and phase converter rotors and can be used for turning the journals of the driving wheels if necessary.

The tool room, situated in the center of the shop, is equipped with the necessary shelves for tools and special equipment, and contains a 14-in. engine lathe and a universal milling machine. The carpenter shop has a combination wood-working machine, which consists of band saw, planer, rip saw and wood lathe.

In the blacksmith shop are two forges, one of which is used for babbitting work. These are supplied with air from a special motor

General View of Virginian Locomotive Maintenance Shops.

driven blower. For heavy work there is a 600-lb. air operated hammer, the air being supplied by a motor driven compressor which is integral with the hammer. An electric pyrometer is used in connection with the babbitting furnace to insure that the babbitt is poured at the proper temperature.

A separate room enclosed by a wire screen is used for the repair and testing of the air equipment. This room is furnished with benches, a test rack designed for testing the air brake equipment used on the locomotives, and a special rack for testing magnet valves.

On the ground floor offices are provided for the timekeeper and crew dispatcher, the general foreman and the electrical foreman. The washroom and toilet facilities are across the hall from the offices, and there are three locker rooms for enginemen, white shopmen and negro shopmen. A shower bath is installed in the enginemen's locker room.

A gallery above the offices and locker rooms is used for the repair of the light electrical equipment of the locomotives, such as switches, magnet valves, relays and brushholders. Compressed air at 70 lb. pressure, as used in the control of the locomotives, is available at all of the benches.

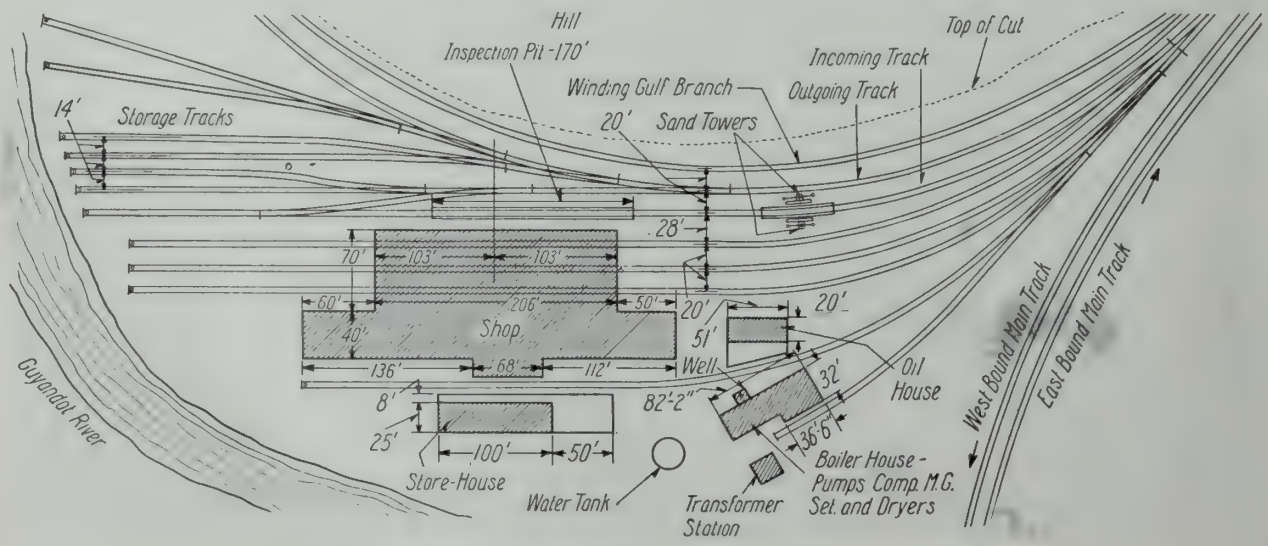
A separate room is provided for repairs to delicate relays and meters. This is equipped with a test table from which the various low currents and voltages for use in calibrating these instruments may be obtained. It is intended that in addition to the locomotive meters the meters and relays from the substations and power plant shall be repaired here. The gallery also contains a room used both as an office for the road foreman of engines and an instruction room for enginemen.

Two independent ovens especially designed for this purpose by the Westinghouse Electric & Manufacturing Co. are provided for drying and baking the electrical apparatus. They are built of heat insulating material and are heated by electric heaters. There is a chamber above each oven equipped with a ventilating fan and dampers providing circulation of air through the oven during the drying.

The temperature of the oven is maintained automatically between desired limits by means of a thermostat which operates the control of the electric heaters, and current is cut off automatically whenever the oven doors are opened. A record of the temperature is kept by Bristol recording thermometers. A voltmeter and necessary connections are provided for measuring the insulation resistances of the apparatus being dried without opening the oven doors. These ovens, with the dip tank are in a wing of the main shop.

In laying out the arrangement of the dip tank particular care was taken to minimize the risk from fire, due to the highly inflammable character of the insulating varnish used. The tank is in a separate room having fireproof doors and a ventilating fan to exhaust the vapor into the outside air. An emergency tank of the same capacity as the dip tank is buried below the latter. In case of fire a valve may be opened from the outside which will allow the varnish to flow by gravity into the emergency tank and thus extinguish the fire. Connections are made to this tank so that the varnish may be raised again to the dip tank by air pressure. The dip tank is provided with a lid also which will close automatically by gravity in case of fire.

The storehouse is 25 ft. by 100 ft. and has a large platform for unloading material, and for storing castings and other material not requiring protection from the weather. There are steel shelves for the various spare parts of the locomotives and other necessary material. It also contains an electri-



Plan of General Layout of Virginian Locomotive Inspection Shops.

cally operated water still supplying all the water required on the road.

The oil house is a separate building with a large platform for barrels and boxes of grease. It is fitted with tanks for oils of which small quantities are used, and has measuring pumps connected to the underground tanks in which the large amounts of oil are kept. An air operated press for forming drive journal grease cakes and the grease sticks used in the main rods and for hubliner lubrication is placed here. At one end of this building is a separate room for lanterns, flags, engineer's tool boxes and other locomotive supplies.

Two Westinghouse 200-kw., 250-volt, single-phase synchronous motor generator sets supply the 250-volt direct current for operating all the shop machinery and the lights. The power for driving these sets is obtained from the 11,000-volt trolley wires and the voltage is stepped down by two transformers, one for each machine situated in an outdoor substation. The sets are started by single-phase series motors, mounted on the common shaft, the transformers being arranged to give the reduced voltages required for this purpose. Disconnecting switches are provided so the transformers may be supplied from either the eastbound or westbound trolley to provide for continuity of service.

The switchboard contains the following panels: 2 a-c, motor, 2 d-c. generator and 3 d-c. feeder panels. The d-c. feeder lines run to distribution panels in the shop where the fuses and switches for the various motors and lighting circuits are placed. The substation room also contains a single stage, 12x10 air compressor providing compressed air for shop purposes. An emergency connection is provided for connecting locomotive compressors to the shop air system in case of breakdown of the shop compressor.

All Machine Tools Have Individual Motor Drive.

As the transformers used on the locomotives are of the oil insulated type, arrangements have been made for the purification of this oil. These consist of a Westinghouse oil treating outfit in the substation room, two oil tanks buried in the ground and pipe lines to the shop. There are two of these lines, one for the clean and one for the dirty oil, each with three outlets on each side of the shop, properly spaced to take care of a 3-unit locomotive. By means of a manifold and valves the dirty oil can be run down into one of the tanks and fresh oil pumped into the transformer, or the oil can be taken out through the filter into a tank and then passed through the filter again into the transformer. By this system the oil of all the transformers of a 3-unit locomotive can be completely purified in one day. This piping is also arranged so that the oil in the substation transformers can be passed through the same filter if desired. Two additional tanks, with the necessary piping, have been provided to purify the oil used in the circuit breakers without mixing it with the transformer oil.

One end of the substation building is used for sand storage and drying, a coal stove being used for the latter purpose. The dry sand is put into one of two drums, each connected to one of the sanding towers, and raised to the towers by admitting air to the top of the drum. The two sanding towers are situated one on each side of the incoming track. Each tower has three outlet pipes, spaced to accord with the openings of the locomotive sand boxes. This enables a unit to be sanded completely without movement. As the sand box openings are on the outside of the cabs, no sand enters the equipment compartment.

Among the new features in this shop are the two portable electric pinion heaters, made by the Westinghouse Company. These are of the induction type, being really the primary of a transformer, the pinion itself being used as the sec-

ondary and being heated by the current which passes through it. With these heaters the locomotive pinions are heated more rapidly and uniformly than is possible in an oven, about 35 minutes being required to raise the temperature to 135 degrees Centigrade, the temperature at which the pinions are applied to the traction motor shafts. While these heaters were primarily designed for pinions, they are used for heating bushings and other rings which are to be shrunk on.

The policy of using special tools and mandrels wherever desirable has been followed from the beginning, a large supply of these being obtained with the locomotives. Since that time additional tools have been made as soon as they were seen to be of advantage.

—F. J. Koch Photo.

The Graveyard of Old Rails Where They Lie Until Turned Into Various Important Uses of Commerce.

A Use For Old Rails

By Felix J. Koch

One of the large mid-western steel corporations, the Pollak Steel Co., of Cincinnati has been fostering the use of steel bars made of condemned railroad rails. Constant passing of heavy trains over these rails has compressed the molecular structures tremendously which makes the material ideal for reinforcing and similar purposes. The rails undergo a distinct process in their travels from what would have been the scrap heap back to service here. Slitting, under great heat, is one of the most interesting phases. The picture shows 10,000 tons of railroad rail awaiting such treatment. So far as their use in transportation is concerned, the end of the long trail has been reached unless they are made into steel ties which already is being done by the General Electric Co.

Nineteen major rolling-mills, the country over, have adapted their plants to converting the rails to better ends than ever before. They are changing them to reinforcing bars and other shapes, for use the world about. Mills so employed represent an investment of $20,000,000 with an annual output of a million tons of bars and forms. Every penny's worth of this material is reclaimed from discarded, useless railway rails. The centers for this industry are at Chicago, Franklin and Williamsport, Pa.; Syracuse, N. Y.; Marion, O.; and Madison, Iowa; Huntington, Ind.; Steubenville O., and Moline, Ill.

Old rails constitute an ideal source of re-inforcing material in modern construction. In such construction, the principal stresses, or strains, with any member or section are compressive and tensile, or drawing steadily out. If the section is to be built of concrete it must be re-inforced at the points where such stress appears. This is for the familiar reason that concrete has an extra high compressive strength. It has really very little value at all where tension is needed.

Re-inforced concrete, on the other hand, means much to the builder, a combination of the concrete and steel bars or rods so placed as to form a structural member of just the desired sort.

It has been found most feasible to separate each abandoned rail to three parts. These are head, web, flange. The parts are rolled separately. The production of a steel rail parallels exactly the production of ordinary steel billets, up to the actual rolling-out process. Head, web and flange may be considered so many billets from which bars, light angles and tees, may be rolled. The work is done in just the same way that similar sections are rolled from billets. Rails are bought from the railways according to specification. They must be 50 pounds, or heavier, to the section. They must be at least five feet in length. They must be free of frog, switch, guard, curve, bend, twist, split-head rail. At the mill, they are sorted into lengths. Heads of extra large rails are used to roll into bars of large cross-section and length. Web and flange of a shorter rail will be rolled to bars of smaller diameter, or for smaller sections.

In sorting, rails showing surface defects are set aside. These defects are removed at one point. The rails are re-weighed and placed in proper lots. There is a second inspection of all, for more such defects.

How to Cook and Serve in A Diner

By W. E. Bliss

Ros' Bif Rare in the Compact and Cleanly Kitchen of A Pennsylvania Diner.

IF EDUCATION and demonstration can do it the Pennsylvania Railroad seems determined to put its dining car personnel upon a high standard. The company has been giving attention for several years to instruction with the printed word and the personal work of traveling chefs covering the road's entire dining car schedules. For some time every Pennsylvania Railroad dining car chef has received not only complete printed instructions covering the preparation of every dish on his menus, but personal assistance from these experts as well.

While these measures assisted materially in rendering satisfactory and efficient service, the management felt there was room for still more fundamental training of stewards, cooks and waiters, particularly in the case of men new to the work and unacquainted with Pennsylvania Railroad service standards. Much study and thought in this direction resulted in the opening, recently, at Columbus, Ohio, of the world's first training school and experimental kitchen for dining car employes.

No detail has been spared to make this unique educational institution complete. The facilities of the school embrace an exact reproduction, both in space and equipment, of the latest type Pennsylvania Railroad dining car, built into and forming a part of the Columbus commissary building. Every feature, from cooking utensils, range, boiler and pantry, to the dining room and tables for patrons, has been faithfully reproduced in the commissary. Even the connecting aisles and corridors have been retained and conform exactly in shape and dimensions with the standard dining car plan.

With this equipment it is possible to carry on demonstrations and conduct classes under exactly the same conditions as prevail in cooking and serving meals on the road. The men see everything done in an ideal way by skilled instructors, using the same facilities and working in the same space as is at their disposal on the cars.

In this familiar environment the most improved methods are quickly grasped and correct technique is retained for ready application in road service.

Expert chefs with wide experience in famous hotels and restaurants, European and American, have been placed in charge of in-

struction in the training school kitchen. Every feature of the cooking art is taught with the greatest thoroughness, ranging from the preparation of cuts of meat for roasting to the creating of the most delicate sauces and salads.

The courses of instruction cover the preparation of raw meat cuts, poultry of all kinds, fish, soup stock, sauces, eggs and omelet dishes, vegetables of all kinds, cold meats and garnishings, salads and relishes, hotbreads, puddings, pastries, coffee, tea, etc. Instruction is also given in the various methods of cooking, such as broiling, boiling, braising, fricaseeing, frying, etc., and in the terms used to denote the various dishes and combinations.

In the dining room section of the school, an "instructing waiter," a veteran of the service, possessing wide knowledge and long experience in the art of pleasing patrons with deft service, has been assigned the duty of training and coaching waiters as to the proper

J. A. Bell, Veteran Dining Car Chef on the Pennsylvania, Makes A Delectable Offering.

methods of serving every item on the menu. Courtesy, personal appearance, care of silver and linens and kindred subjects are covered with equal thoroughness. Every minute detail involved in the placing of food on the table and the proper arrangement of dishes, etc., is exhaustively treated from the viewpoint of deft and pleasing service and satisfied patrons.

The experimental kitchen of the school will also be put to other uses. For instance, the expert chefs will continually engage in tests to develop improved methods in the preparation of food and new and better dishes and combination of dishes. As fast as these new methods and dishes are perfected they will be embodied in the course of instruction given dining car crews and made available for patrons on the trains.

The very latest recipes of well known chefs at leading hotels and restaurants will in like manner be analyzed and tried out. If found suitable for dining car service they, too, will be added to the school's curriculum.

One 4,000 ton coal train, including weight of equipment, is required each day to operate the locomotives of the Boston & Maine Railroad.

An Instructing Waiter in the Pennsylvania School for Dining Car Crews Shows How to Prepare and Serve A Salad in Such A Way That the Price, Low As It is, Fades From the Mind.

Training for Railway Work in England

A Comprehensive Course

By Rt. Hon. H. G. Burgess, P. C.

Gen. Mgr. L. M. & S. Ry.

THE London Midland & Scottish Railway Company's arrangements for the education and training of its staff are of a comprehensive and extensive character. It is the company's practice as far as possible to recruit the staff by taking on boys or girls at 15 or 16 years of age, and train them thoroughly by placing them to various duties in turn, and moving them about from one part of the line to another. These arrangements apply particularly to operating staff in the traffic department, and to the clerical staff generally. This practical training is supplemented by providing educational facilities in a large variety of subjects, and such facilities are, generally speaking, available to all grades of staff of any age, whether employed as juniors or entering the service as adults. The company's educational scheme provides:

Classes for juniors who are preparing for their efficiency examination.

Classes for the clerical staff of any age who desire to improve and increase their knowledge of freight and passenger station clerical work.

Commercial and technical courses of instruction at evening schools, institutes, etc., by arrangement with local education and university authorities; generally open to all the staff, irrespective of age or grade.

Lectures and discussions on a variety of subjects of special interest to railwaymen; these are open to all the staff, irrespective of age or grade.

The educational centers are fixed at important stations and depots throughout the whole of the system, and the classes are so arranged as to enable all the staff at or near the centers to take full advantage of the facilities offered. The instruction usually is given between 6 and 8 p.m., and in most cases each lesson or lecture is repeated the following week in order that the staff working early and late turns of duty may attend conveniently for a complete course.

The subjects dealt with touch upon all of the many branches of railway activity, and include:

Freight and passenger station working, etc. This course, in a series of 48 lessons spread over two sessions, covers every branch of railway station clerical work, and makes provision for study of the L. M. & S. and other railways, with principal junctions, connections, steamship routes, etc., also for commercial English, precise writing, etc.

Bridge re-construction; claims, cause and prevention; coal workings as affecting railway maintenance; commercial law as affecting railways; creosoting of timber; dealing with cattle traffic; freight shed operations and terminal costs; ideas on probable development in lay-out and working of freight stations; locomotive boiler fittings; lubrication of locomotives; machine shop practice; manufacture of rails; modern transport by road and rail; motors vs. horses for call and deliver traffic; organization and management of a railway freight station; organization and management of a railway steamship service; railway cartage organization; railway operation; railway operation from a commercial aspect; some metals, their history, properties and uses; the construction and maintenance of cars, passenger and freight; the construction and maintenance of signals and signalling equipment; the permanent way; valve gears suitable for locomotives; Westinghouse brake on locomotives; workshop cost systems; workshop organization.

The instructors and lecturers are in practically all cases members of the company's staff who possess a wide experience of the subject on

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A NOTABLE EDUCATIONAL SERVICE

SOME of the principal railway officials of England, South Africa, India, Australia and New Zealand are to contribute to this magazine, during the winter, a series of articles of which this is the first. These articles will describe in detail the methods and courses offered in the educational program arranged by the railways of the countries named for training young men and women in the several branches of steam transportation. Every railroad man in the country, but especially those having charge of the apprentice schools, will find much helpful material in the series.

A glance at the courses described by General Manager Burgess in the present article shows that in many respects the English educational program is far more comprehensive than anything offered on railroads in the United States. Perhaps this will be noticed first in the courses offered to young persons wishing to become clerks or stenographers, and for others interested in traffic work, freight and passenger. Through the cooperation of public officials engaged in educational work the London, Midland & Scottish Railway Co., provides opportunities for young persons certain to prove valuable in creating a reserve force competent to undertake the duties of railway employes whenever vacancies are reported without the confusion and delay ordinarily encountered.

Steel Passenger Cars for the London, Midland & Scottish Ry., in Course of Construction at the Works of the Midland Railway Carriage & Wagon Co., Ltd., at Washwood Heath, Birmingham. Wide World Photo.

which they are required to impart knowledge, and at every meeting questions are invited and discussion encouraged. For the comparatively few employes who, by reason of traveling difficulties are unable to attend the classes, efforts are being made to give instruction by correspondence.

The staff is allowed to attend all the classes and lectures free. Traveling facilities within reasonable radius, are given to those desirous of attending.

The scope of the work has been considerably extended by the cooperation of a number of local education authorities. With their assistance courses of instruction on subjects specially suited to the needs of the railway staff in the districts concerned have been instituted at Barrow-in-Furness, Crewe, Derby, Earlestown, Glasgow, Holyhead, Horwich, Huddersfield, Manchester, Perth, Wolverton, etc.

At Euston numbers of classes are run in conjunction with the London county council at which the following subjects are dealt with:

Arithmetic, book-keeping and accountancy, commercial law, economic geography, electrical engineering, English, French, German, office routine, railway accounts, railway administration, railway audit office work, railway rates and charges, railway economics, railway geography, railway law, railway station office work, freight and passenger, shorthand.

In many cases time off is given the clerks in order that they may attend these classes. Text books are lent for the period of the course, and tuition fees are paid by the company.

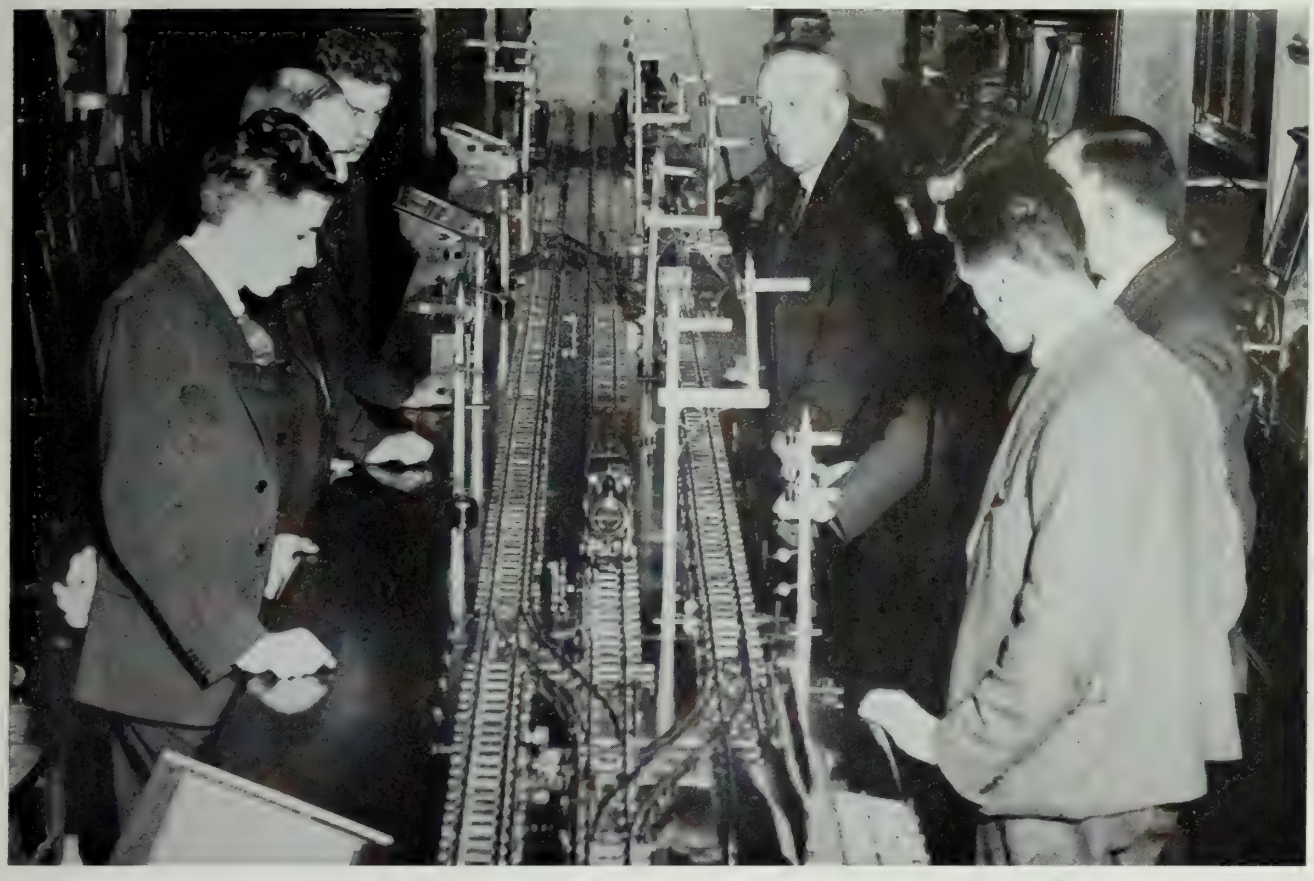
Special arrangements also exist at Derby whereby the railway company pays the whole of the fees on behalf of the staff attending the local evening schools for courses of instruction framed to meet the requirements of the L. M. & S., clerical staff; the subjects dealt with here are principally commercial correspondence, commercial arithmetic, English and shorthand.

Arrangements have also been made with the London School of Economics, the Universities of Birmingham and Manchester, and the Glasgow and West of Scotland Commercial College, for the attendance of the clerical staff at lectures on a large number of subjects having relation to transport, as under:

Accounts of traders and companies (Parts I and II), business organization, commercial railway economics, control systems in railway working, economics of transport, general economics, with special reference to transport, general statistics, industrial councils on the railways, maritime law, modern road transport operation, operating railway economics, organization of transport, railway accounts, railway and commercial geography of the United Kingdom, railway statistics, rate making in practice, ships in relation to their work, the commercial side of passenger traffic, the growth of English industry, with special reference to the period after 1760, the law of carriage by railway, works and factory accounting including cost accounts.

In addition to the foregoing classes for instruction in signalling are regularly held at the company's school of signalling at Victoria Station, Manchester, which is equipped with a miniature electrically worked railway. Block signalling classes are also carried on at a large number of other stations. The signalling classes are open to the staff of any age or grade, and, as in the case of the other classes and lectures, admission is free and traveling facilities, within limits, are given.

Locomotive men's mutual improvement classes, which are well attended by members of the mo-



The Education and General Training of the Staff of the London, Midland & Scottish Ry., Began for the Season in November. This Photograph Was Taken Recently in the School at the Manchester Station While Students Were Studying the Model Railway With Signals, Trains and Things. P & A Photo.

tive power department, are regularly held at a large number of stations. At these meetings lectures are given on subjects having a very direct bearing on the men's vocation, and most useful and interesting discussions take place. At practically all the larger centers there are railway institutes supported by the company at which members of the staff meet for social and educational purposes. Some of these institutes contain excellent libraries, and lectures and debates are a regular feature.

The company owns a library comprising nearly 2,000 volumes dealing with railway and allied subjects, membership of which is open, free of charge, to the clerical and supervisory staff. About 200 books are sent out every week to staff members situated at different parts of the line.

At the close of the sessions students are tested as to their knowledge of the subjects dealt with in the various classes, and prizes and certificates are awarded to those attaining a certain standard of proficiency.

With the development of the educational work generally, the company's entrance examinations for applicants, and efficiency tests (at age 18) for the clerical staff have been coordinated and standardized, and a system is now in operation which is common to the whole of the line. All applicants for clerical positions, both boys and girls, are required to pass an entrance examination before they are engaged. This examination is common to all departments and to all applicants, and is conducted at convenient centers by examiners attached to the various departments. The subjects dealt with are English, geography, arithmetic, shorthand and handwriting.

Candidates who are successful at the entrance examination are engaged as suitable vacancies occur and, subject to passing the efficiency examination, receive promotion to the senior scale of pay at age 18. The efficiency test consists of a general educational paper and a supplementary departmental paper; the general educational test comprises commercial English, railway geography, rules and regulations, arithmetic, and shorthand (speed); the supplementary paper consists of questions applicable to the work performed in the department in which the examinee is employed.

The paper set for girl and women clerks is very similar to the one for male clerks, except that the former are required to have a knowledge of general office routine instead of railway departmental work.

Classes for the training of men in ambulance work exist at a large number of stations over the entire line; at a few of the larger centers

The London, Midland & Scottish Flyer, the Royal Scot, Leaving Euston Station on the World's Record Non-stop Run to Carlisle, 299¼ Miles. Wide World Photo.

sick nursing classes for girls and women are also held.

The question of accident prevention is being kept prominently before the attention of the staff through the medium of the L. M. S. Magazine, etc. Recently the company prepared and issued to the staff a booklet on the subject, entitled "Prevention is Better Than Cure." This publication has been generally recognized as a useful contribution to "Safety First" literature.

The method of appointment, and the training of apprentices is at present under consideration with a view to standardizing the various arrangements in respect thereof.

The L. M. & S. Company's educational scheme, combined with the practical training is intended to link up, improve, and extend the various existing arrangements throughout the system. It is hoped thereby to establish a progressive course of education and training which will broaden the outlook of the staff generally, and at the same time bring about the greatest possible efficiency.

He lives long that lives well.—Thomas Fuller.

Short Skirts Save Time

William Prior, train inspector at Blackheath, England, who is retiring after 52 years of railway service, says young trainmen do not realize what a blessing short-skirted, athletic women and girls are to the railways.

"Why, when the women wore hoopskirts we had to squeeze the dear things into the narrow car doors. Then there came another tussle to get them seated without disaster," declared Prior. "In the days when they wore both bustles and hoops it wasn't possible to get five of them seated in the space assigned to five passengers and the trains were often delayed in the effort to get them settled. Fortunately a delay of a few minutes wasn't as disastrous then as it would be in these days of fast schedules."

Justice

A verdict of $2,300 damages was handed down in an Illinois court in favor of the New York Central Railway against the owner of a heavily loaded truck which was struck by a freight train at a street crossing. The train was derailed and the finding of the court was that the accident was owing to the carelessness of the truck driver in attempting to beat the train at the crossing.

Train Tours For Students

A new method of education is being developed by the Princeton University summer school of geology and natural resources, which has completed its second annual train tour of research and study.

Through the use of a special Pullman car combining the features of classroom, dormitory, dining hall and recreation center, the Princeton geology class has been able to go across Canada from one side of the North American continent to the other, stopping where the rocks themselves could teach the best lessons. During the day an interesting locality was visited and just before dinner time the class returned to its traveling home. Dinner was served, a lecture held and a night's rest obtained while the party was en route to another locality, perhaps hundreds of miles away.

Santa Fe locomotives, while in operation, consume coal at the rate of about 3,600 pounds per hour. This is the average figure.

When Beacon Lights Are Burning

Trusty Guides for Night Flyers

By Major H. H. Arnold

U. S. Army Air Corps

A Beacon Light to Guide Planes to the Airdrome.

DURING the period immediately following the World War there was a universal demand for the commercial use of aircraft. Hundreds of war trained pilots, released from the services of the various armies and navies, had been fitted for a new vocation, and wanted to continue it as a profession. Aircraft factories were about to close down for lack of orders on account of the army and navy air services being overloaded with war built planes. The governments themselves were very desirous that a new demand for aircraft be created as it would provide a means whereby the aeronautical engineers could continue that steady development which had been so marked during the war period. Furthermore, it was almost essential that airplanes be produced which might have a use in the military services. Thus it was that in 1919 commercial airplane lines were not only started but also in most cases were subsidized by the governments.

A complete network of air lines grew up which finally spread over almost all of Western Europe. Airports were established near the larger cities and were provided with practically the same facilities and accommodations found in railroad terminals. Bulletin boards showed the times of departures and arrivals of aircrafts for other large cities. Waiting rooms were provided for passengers. Special automobile buses carried the passengers direct from their hotels to the airports. Tickets were sold and attached coupons covered the bus rides to and from the airdromes. Announcers informed the passengers of the time and place of the departure of their planes. Ticket collectors punched the tickets as the aerial voyagers climbed aboard the planes. Every possible detail then known was provided for the safety and comfort of the passengers, but accidents occurred and the planes seldom took off with a full load.

In the United States the development proceeded more slowly. We started with an aerial mail system operating across the continent during the daylight hours. Our policy was to learn all we could from that before putting complete commercial lines into operation. In a few years we had developed the most extensive and efficient aerial mail service in the world. We were running a schedule by which New York mail was delivered in San Francisco in about 30 hours. Part of the line was operated during the day and the remainder at night.

This mail service operated the year around with over 90 per cent of the trips on schedule despite the poor flying conditions in winter, the high altitudes necessary to cross the Rockies, and the night flights over a large part of the route. The accident rate was almost negligible.

In order further to demonstrate the feasibility and safety of commercial aviation under proper supervision and after adequate preparations have been made, the United States army air service operated a model airways system connecting New York, Washington, Dayton, Detroit, St. Louis, Muskogee, Dallas, and San Antonio. In its operations everything possible was done to secure efficiency of operation and safety of the personnel in the planes. This system had completed over a million airplane miles without the loss of a single life when it ceased operating.

It is not sufficient that there be a desire to establish an airline and that pilots are available for the planes. Efficiency of operation and safety of pilots and passengers are obtained only by careful forethought and planning. Considerable ground work must be completed before a line is started. The principles for this ground work were made known by much experience, and in some cases came as the result of fatal accidents.

The essential elements for the successful operation of commercial airplane lines are, well developed airports and emergency landing fields; regular supply of weather reports from the next port of call; airplanes designed and built for the purpose for which they are used; constant maintenance of

This is the third and last of Major Arnold's articles describing the development of aviation.

Light Mounted on the Tip of the Airplane Wing of A Night Flyer.

equipment in a highly serviceable condition; properly trained and highly experienced pilots flying the planes; beacon lights at all airdromes where planes will take off or land at night; flood lights to illuminate airdromes; blinker lights so located along the route that planes flying at night will always have at least one in sight at all times.

Adequate airports are as essential to airplanes as good roads are to automobiles. The airdromes must be of sufficient size to permit a heavily loaded plane to take off with safety regardless of the wind direction. The landing field must be smooth enough to eliminate any possibility of the plane crashing if forced to land abnormally due to engine failure, bad weather or darkness. This necessitates the removal of all obstacles surrounding the field and providing a runway for the planes at least 2,500 feet long.

It can be accepted as a general principle that the crew of an airplane is safe as long as the plane can stay in the air. The trouble usually comes when the airplane hits the ground unexpectedly. If the weather is clear the pilot normally can make a safe landing, but when his vision is obscured by rain, snow or fog, he has no idea of what is ahead of or under his plane. It is almost suicidal for a plane to take off and head into an area in which it is known that fog is lying on the ground. Sooner or later that pilot will be flying over the fog without any knowledge of what is under him or he will be flying through or under the fog with the constant danger of running into an obstacle and wrecking his plane. Rain and snow can limit the visibility in exactly the same way that fog does.

Weather reports, when given to the pilot just before his take off, accomplish two purposes. They give him sufficient data to determine whether the conditions are sufficiently satisfactory for him to start his trip, and they give him added confidence in his ability to get to his destination. A delay of an hour may mean entirely different weather conditions along the route. The weather reports also give him the wind direction and velocity at different altitudes. Thus he may be able to pick an altitude for his trip at which he will have a favoring wind. If the weather conditions are reported as dangerous at the next station, the pilot is not permitted to leave the airdrome.

Immediately following the World War there was a tendency in this country to take war built planes and use them commercially. Such planes were far from satisfactory as they did not possess the flying qualities, comfort and safety for passengers or the cargo compartments essential to a properly built commercial plane. In Europe, on the other hand, commercial planes were designed and built for that purpose. The United States air mail service ultimately created a demand for commercial planes in this country, and that demand has been met by the designers and factories. The old war built planes are a thing of the past, and all operating lines in the United States now have planes suitable for the use to which they are put.

All airplane pilots are not capable of becoming successful, commercial cross country navigators. Lindbergh's rise to the front rank of airplane pilots was meteoric but he had the background of the difficult and thorough army training and commercial aerial mail service experience. Furthermore, he had that inherent flying sense which makes a man come to the proper decision when faced with a dangerous situation which may end disastrously. He also possesses the navigating instincts of a homing pigeon. Such instinct is born in a man and not acquired. Although a certain amount may be developed, there are certain pilots who rarely fly from one point to another without getting well off their course or losing themselves completely.

A few seconds' delay in the air in coming to a decision may mean the difference between life and death. Then again the wrong decision made with regard to running through or around a storm may mean a safe journey or a crash. The fact that a pilot is off his course several miles may make no difference when flying between Los Angeles and Salt Lake City, but when trying to hit a few scat-

The New Flivver Plane Used by German Business Men, Built With Folding Wings So It May Be Filed Away in the Garage When Not in Service. Underwood Photo.

tered islands in the middle of the Pacific, it may make sufficient difference to cause the plane never to be heard from again. Any of the aforementioned conditions might have existed with reference to planes making trans-oceanic flights, and might explain the mysteries connected with the whereabouts of those still unaccounted for. Maitland and Hegenberger were highly trained pilots and expert navigators. They had a plane equipped with all modern instruments and accessories. These men left nothing to chance. They spent months planning and preparing for the flight to Hawaii and they made it.

Night flying will practically be essential to the success of all commercial air lines. The only excuse for utilizing airplane transportation is speed. If the travel is performed through the air only during daylight hours, the slow moving train will catch up to the plane before morning comes. As the cost of airplane transportation is much higher than that of railroads, sufficient time must be saved to make passengers and shippers willing to pay the difference. On long hauls this can be done only by operating the planes night and day.

For centuries lighthouses have been recognized as essential to the safety of ships coming into ports. In the same way, beacon lights are used to guide airplanes into their airdromes. These beacon lights throw a revolving beam into the sky at an angle. As the aviator approaches the airdrome on a clear night, he can see the beam for miles. On cloudy or rainy nights, while more difficult to see, it makes a glow on the clouds which is quite distinctive.

The airplane is equipped with wing lights. These lights throw a beam to the ground and although they can be used in emergency when a forced landing is made, they have not sufficient range or power to light up obstacles sufficiently far away for general landing purposes. Accordingly they are used ordinarily as signals to the ground as the airplane approaches.

The Huge Cabin of the Double-Tier Lawson Super-plane Air Liner, Three Times As Large As the Largest Plane Ever Flown; Now Being Built at Garwood, N. J. It Is Expected to Carry 100 Passengers. P & A Photo.

At night the limits of the airdromes are marked by boundary lights. These are low powered electric lights, mounted on short supports placed at regular intervals around the flying field. When the boundary of the field is irregular, it is customary to mark the changes in direction with lights of different colors. By thus outlining the field, the boundary lights assist the pilots coming in to land at night.

Flood lights are generally placed on or near the hangars. They are sufficiently powerful to illuminate the ground brilliantly in their front for a distance of about 2,500 feet. When a plane approaches the airdrome, the flood lights are turned down the runway. Thus the aviator is able to land his plane under almost the same conditions, in so far as visibility is concerned, at night as during the day.

Blinker lights are placed along the airway. The distance between them, depending upon the nature of the country, varies from ten to fifteen miles. It is necessary to have them much closer together in mountainous country or wooded areas than in open level terrain as our middle west. However, they are always so placed that at least one will be in sight of the aviator at all times. In order to distinguish these lights from the ordinary lights seen at night, they are so arranged mechanically that they blink at regular or irregular intervals much the same as the lighthouse lights.

The lighting system described is the development of our mail service and is now used on practically all airways where night flying is being done or is contemplated. When the air mail routes in this country were taken over from the government by private contrac-

Flyers Do Not Always Have An Easy Time. The White Patches on the Wings of This Bird Cover Holes Made by Hail. Hailstones "As Big As Hen's Eggs" Sometimes Go Right Through the Wings, Breaking the Ribs As they Go.

tors last July, the lighting system installed was continued in operation for their use.

At present we have the most efficient and complete air mail system in the world. Other countries may have a larger and better organized passenger carrying service but they have not as yet developed the extensive air mail service operating on regular schedules.

The large nations have already installed or are now installing networks of airways complete in all details. In a few years air travel will be as regular as train travel. However, air travel will not be accepted by the general public until it has complete confidence in the planes in use and the efficiency of the operating companies. This confidence can be built up only by eliminating accidents through careful preparations and modern installations on the ground and in the air.

The regular trans-oceanic travel will be the next step when air travel over land is an accepted fact. Then, the aviators of today who have made a study of the problem, who have made successful flights across the oceans by taking every possible precaution before starting their flights, such men as Lindbergh, Chamberlin, Maitland, Hegenberger and Byrd will be hailed as the pioneers who made regular trans-oceanic flights possible.

Progress in Civil Aviation

A report from the aeronautics branch of the department of commerce shows that during the first six months of this year commercial planes flew 12,377,933 miles and carried 395,646 passengers. The records of privately-owned and operated planes or of those used for testing purposes by manufacturers, or engaged in contests, are not included in this total.

Planes operated by transport companies on regular schedules flew 2,642,364 miles and carried 1891 passengers and in miscellaneous trips flew 362,249 miles and carried 8305 passengers. Planes used as air taxis and on sightseeing, express, and other miscellaneous flights flew approximately 9,373,320 miles, with 385,-450 passengers.

One interesting feature of the report is that during the six months 4587 of the 5272 trips scheduled by civil aviators, including those employed in the postal air service, were completed safely, establishing an efficiency percentage of 87 per cent for the commercial airways. Of the trips scheduled, 179 were not started and 506 were uncompleted.

Dangerous weather and darkness, according to the report, accounted for 623 failures to start or complete trips, structural defects in 28 cases caused trips to be abandoned or caused mishaps en route and in 30 cases a shortage of necessary equipment was given as cause for failure to start.

An Early Day Air Trip

Thumbing the pages of local history, Bridgeport, Conn., discovered, the other day, that the first attempt at transAtlantic aerial voyaging originated there in 1856, when the balloon Bridgeport set out for Paris.

The trip was not completed. The Bridgeport got only six miles from Bridgehampton, near the southern shore of Long Island, where it alighted wiht its crew of five, little the worse for their hazardous adventure.

Their projected trip was obviously hopeless. The motive power was to have been the winds, which, the crew hoped, would waft them across the 3500 miles of ocean. In their short trip the balloon ascended 23,000 feet, or nearly five miles, which was for some time an altitude record. Sheets of ice coated the bag and forced it down.

A Model Supply Train Service

By J. H. Cragin

General Storekeeper
L. A. & S. L. Ry.

Someone Had to Slip the Word "Car" Into This Stenciling to Avoid Confusion. Just When We Were Preaching Economy, Too.

SIX store department supply train cars were completed in the Los Angeles shops of the Union Pacific in 1926 and 1927. Five of these cars were rebuilt on 100,000-capacity steel underframes equipped with Farlow draft gear, type D couplers, 10-inch air brakes, K triple valves, rolled steel wheels, and elliptic springs. The cars were constructed according to blue prints and specifications supplied by the store department.

The underframes of these cars were overhauled and placed in first class condition. Superstructures are double sheeted with red resin paper between the siding and the lining. Tongue and grooved lining and flooring were used on the interior. In addition the cars are equipped with special circular side door hand-holds and safety steps, and because there are end doors, adjustable safety platforms were placed on the cars which can be raised and lowered with chains. Safety chains have been provided also extending from one car to the other which answer the same purpose as hand rails. Also all of the material cars are equipped with sliding side doors provided with Ideal door stops to prevent doors sliding and causing injury while cars are in motion. All cars are equipped with electric lights, current being supplied from a generator plant in one of the cars.

A supply tank was converted from one of the latest steel underframe 12,500-gallon tank cars, equipped with all the latest arrangements to facilitate supplying oil to stations along the line.

The living car is divided into three sections, sleeping, dining and kitchen. The sleeping section has four sanitary beds, and is subdivided into a Pullman section that can be made up whenever necessary to provide additional accommodations for four persons. In this same section there are two large closets for work and dress clothing, shower bath, washroom, lavatory, and a 380-gallon overhead water tank.

The dining room section will accommodate eight persons. It contains a heating stove for winter, and a heavy oak table with leather upholstered dining chairs to match. There is also a small desk in the corner in this section for the use of crew in handling clerical work.

The kitchen is equipped with a Banquet range, large refrigerator extending from floor to roof, with ice capacity of 850 pounds, and food compartment space for all perishable food supplies; sink drain boards, dish cupboards, coal box, flour bins, serving table, supply cupboards, and a 380-gallon

This is the Supply Train of Six Cars Specially Constructed and Equipped as the Storekeeper Wished to Have It. Well Lighted, and Arranged for Employes' Comfort and Convenience.

A Large Range, Liberal Space for Refrigeration, and Other Conveniences in the Kitchen.

overhead water tank for the kitchen. The water, supplied by gravity flow from overhead tanks, is put in at the top. The kitchen and dining room floors are covered with linoleum.

One half of the tool car is equipped with 12 tool bins with removable sides and fronts for segregation and storage of all new track tools. The remainder of the car is used for the storage of light, yet bulky articles, such as water kegs, stove pipes, waste containers, etc. The floor and wall of this car are covered with galvanized iron.

The station material car is equipped with three rows of shelving 18-feet long subdivided into 108 bins in which are carried all material classified as station supplies. In addition to the shelving an all-steel broom rack, and an all-steel asbestos lined cabinet for matches, fuses and torpedoes, are provided. The bin ledges are covered with reclaimed carpet, and rubber matting covers the floor.

There are four rows of shelving subdivided into 126 bins in the general material car for all small tools and materials properly belonging in this classification. There is also one Estate stove, with coal box underneath, supply train storekeeper's desk, and rubber matting on the floor.

The paint, waste and oil car is equipped with two all-steel waste and rag bins, 24 bins for small paint material, and 48 bins for the storage of all case oils and paints. The entire floor is covered with galvanized iron, and the walls and end of the section containing the bins for the case oils and paint material are covered with galvanized iron, also thus insuring safety from fire, and at the same time making cleanliness easier in every way.

The distillate tank is equipped with 1¾-inch outlet oil pipes and with air lines for charging the tank to expedite the flow and delivering of distillate.

Especial attention was given in building these cars to the safety, convenience and comfort of supply train employes, and also to facilities for handling and distributing the supplies properly. The entire train was built and equipped in the car shop under W. A. Johnston, general car foreman, and the personal supervision of Foreman R. B. White.

Pullman Berths Also If Needed.

The supply train operates over the line between Los Angeles and Salt Lake City every 60 days, making deliveries of material and supplies. Leaving Los Angeles there are, ordinarily, 25 cars, six being the regular steel underframe electric lighted supply cars just described, and the remainder box, flat and tank cars temporarily removed from commercial service and used to handle such articles as pipe, lime, salt, stoves, stationery, lumber, barrel oil, tie plates, spikes, bolts, other track and switch material, and bulk oil. The regularly assigned supply train cars are placed on the rear of the train. Included in the train are three flat cars with side and end boards for the loading of all track, car and engine scrap accumulated along the line between trips of the supply train. This scrap is taken to Los Angeles for reclamation. This scrap, picked up every trip, averages 200 tons, or approximately 3600 pounds at each of the 109 regular stops. Scrap that is not reclaimed is disposed of later through sales to the various foundries.

The crew consists of one supply train storekeeper and three helpers. All members of the crew have their respective duties assigned them. Between stations the material called for on the requisitions is prepared for delivery and is ready when the station is reached. Each man handles the unloading of the various material assigned to his care and also assists elsewhere whenever needed.

The valuation of all material delivered during a trip is approximately $20,000.

J. H. Cragin, author of the foregoing article, died, unexpectedly, November 28, at his home in Los Angeles, of heart disease. Mr. Cragin had been with the Union Pacific for 40 years.

The Costly Floods

Charts showing just how hard the Boston & Maine R. R., was hit by the floods in November have been presented to Secretary Hoover for his information and for Attorney General Sargent. These charts show a line of flood damage to the Boston & Maine for practically the entire length of the Connecticut

The Dining Section Comfortably Equipped.

River and its tributaries from Groveton, N. H., through Wells River, White River Junction, Bellows Falls, Brattleboro, Vt. and thence down the river as far as Brightwood on the outskirts of Springfield, Mass.; with a string of washouts, slides or lost bridges and culverts along the line from White River Junction to Concord, N. H.; a similar line of destruction between Wells River and Plymouth, N. H., with the Pemigewasset Valley branch between Plymouth and Lincoln washed out almost entirely, and the line from Whitefield Junction, N. H., to Berlin, N. H., washed out in place after place. The Boston & Maine's Fitchburg division is shown in terms of flood damage to have been over-run by the waters or washed out at points between Schaghticoke, N. Y., Hoosick Junction, N. Y., North Pownal, Vt., Williamstown, Mass., Shelburne Falls, Mass., Wendell, Mass., Athol, Mass., and a number of lesser spots between Fitchburg and Ayer.

With the map showing this record of storm damage, went another chart showing the reconstruction results of the past two weeks in terms of accomplishment expressed by President Hannauer's report that out of 946 miles of Boston & Maine road affected by the floods, a survey as of November 15 showed that with work trains putting finishing touches on the restoration of several lines, only 70 miles were still out of commission, including 32 miles of important main lines and 38 miles of unimportant branches. President Hannauer estimated that all important main lines of the Boston & Maine would be in shape for service within a week and permanent reconstruction would be fairly complete on the system as a whole within a month.

The two charts together presented a story of flood damage, reconstruction and of railroad operation under difficulties unmatched in the history of railroading in New England.

There Are 108 Bins Here for Station Materials, An All-Steel Broom Rack, and Asbestos-Lined Cabinets for Matches, Etc.

Earnings Not So Good

Despite the attainment, this year, of the greatest operating efficiency on record, the inability of the railroads to reduce expenses in the same ratio as their revenues have fallen, due in part to the rising tide of wage levels as well as the decrease in both freight and passenger traffic, with revisions downward in many freight rates, and increased taxes, indicates a decrease of railway earnings in 1927 compared with 1926. For the first nine months, the net railway operating income of the Class I railroads was 83 million dollars below the same period in 1926, the rate of return on property investment having declined from 5.22 per cent in the first nine months, last year, to 4.61 per cent for the corresponding period in 1927.

This was the gist of the report submitted by the bureau of railway economics at the annual fall meeting of the member roads of the American Railway Association held November 17 at the Biltmore Hotel in New York.

"If the final returns for the year 1927," said the report, "show the same proportionate reduction in the levels of freight and passenger rates as the first eight months, the average receipts for the year will be 16 per cent less per ton mile than 1921 and 6 per cent less per passenger mile. This is a measure of the contribution made by the railways, during the past six years, to the lowered cost of living of the American people.

"On the basis of the net ton miles and carloadings reported for the past three months, the aggregate net ton miles for 1927 as a whole will not be greater than 480 billion. This will represent a decline of more than one per cent under 1926. Indications are the passenger traffic will be the lowest for any year since 1916, and will be more than four per cent under that for 1926.

"The rising tide of wage levels explains in part the inability of the railways to effect reductions in their expenses proportionate to the fall in their revenues. Since the beginning of 1926, the wage rates of various classes of railway employes have been adjusted upward, with a considerable effect on average wage rates and aggregate pay rolls.

During the first eight months of 1927, average hourly earnings for all classes of employes were greater than in 1926 by 1.3 cents. Applied to the total hours of service for a typical year, this represents an annual pay roll increase, due to increased wage rates alone, of approximately $60,000,000. Demands for increased wages are still being presented and some are now under arbitration.

"In regard to taxes, there has been a slight reduction this year, to date, under 1926 but the reduction was smaller than the decline in revenues. As a consequence, the actual ratio of taxes to revenues has increased, and stands now at the highest point ever recorded, taxes claiming 6.19 cents out of every dollar of revenue in the first nine months this year.

"The railways earned, in 1926, the largest net operating income of any year in history. At the same time, they reported the largest property investment and the largest amount of freight service. This year their property investment has continued to increase, while their contribution to the welfare of the country in terms of service and of reduced rates has also been increasing.

"The increase in railway capital investment may be indicated by the fact that the railways, this year, as in all of the past seven, have been improving their plant, their equipment and their other facilities by the output of large sums of new capital. As a result of these capital expenditures, and as a further development of the program to improve efficiency begun in 1923, the railways have continued setting up new records with respect to various operating factors. The outstanding operating records follow:

Freight traffic this year was handled with fewer trains and locomotives in proportion to the amount of traffic carried.

By attaining an average speed between terminals of 12.3 miles per hour, freight trains were moved faster over a complete journey than over before.

The average load per train including freight and equipment but excluding locomotive and tender, was the highest ever reported, having been 47 per cent greater in the first eight months of 1927 compared with the same period in 1920.

The daily average movement per freight car was the highest ever attained.

Freight traffic this year was handled with the greatest conservation of fuel ever reported.

Condition of both freight cars and locomotives best on record.

"Adequacy of railway equipment to meet possible future increase in traffic demands is a subject open at all times to economic analysis. Light is thrown on this problem by the situation that has existed during recent months in relation to railway equipment, its physical condition and its performance.

"Reports show that 24,392 'active' freight locomotives handled the peak carloadings in October without difficulty and with an actual margin of 3,214 stored freight locomotives or 13.2 per cent of the active number, ready to be called upon in case of any increase in traffic. This did not take into account 1,233 stored passenger locomotives and 954 switching locomotives which have been and can be utilized for freight service if the traffic demands it.

"The corresponding margin of stored over 'active' freight locomotives averaged 15.4 per cent during the first ten months of 1927 and rose as high as 18.7 per cent on August 1 when the margin was greatest. The carloadings, at this time of greatest margin, were running considerably above one million cars a week.

"Similar calculations for freight cars show that on October 15, when traffic was highest, the number of surplus cars in good repair and immediately available against an increase in traffic constituted 7.5 per cent of the number of 'active' freight cars. In other words, at the time of peak loading the freight car situation offered a margin of safety of 7.5 per cent against a possible traffic increase. The corresponding margin for the first ten months averaged 13.3 per cent, rising as high as 17.4 per cent in January.

"The locomotive margin at the peak could handle additional car loadings of nearly 7,000,000 cars a year. The freight car margin at the peak could handle additional loadings of nearly 4,000,000 cars a year. That is, the respective margins would take care of these numbers of additional cars loaded, with equipment that was in service and in good order during October.

"These ratios as to the available margins of freight cars and locomotives are computed on the assumption that no increase will take place in the performance of the average locomotive or average freight car. These factors, however, have been increasing over a period of years, and it is reasonable to suppose that similar increases may continue in the future.

"There has been an increase since 1923 of more than ten per cent in the performance of locomotives while there has also been an increase of nearly 11 per cent in the performance of freight cars.

"This indicates an added service of one-tenth of the total loadings for a year, or approximately 5,000,000 cars due to increased performance alone.

"In other words, increased locomotive performance—not per unit but per pound of tractive power—would have added virtually one-tenth to the available motive power, even had there been no increase in the aggregate units of power. Similarly, the increased performance per freight car per day has had the effect of adding one-tenth to the available supply of cars, regardless of increase in the number of cars actually in service. To the extent that these performance factors show improvement in the future, the margin of freight equipment over that actively employed in handling traffic will tend to increase.

"It is not only the number of units in service that counts, but also the extent to which every unit of power or of capacity is intensively utilized."

Buses in Electric Railway Service

What the Reports of 52 Companies Show

By W. B. Campbell

They're Still Doing It This Way Over in India; or, As Mr. Kipling said, "Elephants Piling Teak, in the Sludgy, Squdgy Creek." Now, on the Next Page—.

THE BUS operations of 52 railways owning 3,084 buses, operating 563 routes covering, 6,731 miles, were described in a report submitted to the Cleveland convention by a committee appointed by the American Electric Railway Transportation and Traffic Association. The reasons for adopting buses and the replies to questions form an interesting and valuable booklet issued by the association.

Thirty-four companies were making use of the bus for extensions. Of these 34 companies ten stated that the reason for the use of the bus was to serve residential sections where there were no transportation facilities; 12 stated that it was for the purpose of filling transportation demands; two stated that it was for the purpose of serving additional territory not warranting rail service; two, that it was for the purpose of meeting the needs of the growth of the community; one, that it was to eliminate competition; seven, that it was to meet the needs of community growth and forestall competition.

Forty-seven companies were using the bus to operate separate or additional routes. The reason given by three of these companies was to serve residential sections without transportation facilities; the reason by eight was to fill transportation demands; by seven to serve additional territory not warranting rail service; by two to furnish deluxe, special or taxi service; by five to meet the needs of the community growth; by 11 to meet the needs of the community growth and eliminate competition.

Only 20 companies had installed bus routes to replace car routes. Ten of these were because of the investment required to rebuild the rail line. Nine were to reduce expenses and one to eliminate competition.

In answer to the question, "Have these installations been justified exclusive of their showing of net increase or loss?" 41 answered "yes" and ten declined to answer.

To the more specific question of "What estimated saving to entire operation was secured by these installations other than shown by actual surplus or loss?" eight stated that there were none; four stated an opinion of savings varying from $40,000 to $200,000 a year; one stated an estimated saving over the same operation by street cars of $450,000 a year; one gave a saving in capital investment of $500,000; one a saving of $5,000,000; four stated that competition was prevented; 19 said they could not answer; and 13 declined to answer.

These answers were very disappointing in that they gave so little specific data from which to present definite information or recommendations, but it makes a very interesting study.

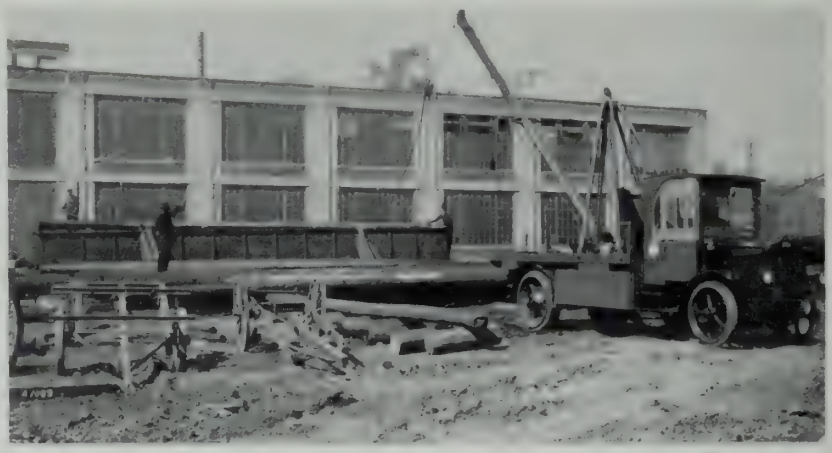
About 80 per cent. of these companies were quite certain their bus operations were justified. This positive answer was given by men who were experienced in the transportation business and were entire-

ly familiar with their local situations, and probably can be accepted without question, but apparently very few, if any of them, had studied the facts sufficiently to definitely place an approximate value on the use of the bus for this service.

The 3,084 buses owned by these 52 companies represent an investment of about $24,000,000 and the use of buses is continuing to increase. Certainly a careful study of the economics of bus operation for transportation service is not only desirable but necessary.

It is interesting to note that in the several stories which have appeared of steam roads bus operations there is always a direct comparison between the cost of each route as operated by train service and by bus service. Steam roads seem to make it a point to know not only the financial return from each individual route, but also whether or not there is a saving by the operations of the bus (or truck for freight service) and how much this is in dollars and cents. It is just as easy for the electric railway operator to have the same information, and the committee thinks it is essential, particularly in view of the present state of the business.

The railway industry owns about 7,000 buses. The 52 companies reporting complete details of operation own and operate a total of 3,084 buses. Of this number 35.4 per cent. were of 29-passenger capacity; 16.6 per cent. were 21-passenger; 15.2 per cent. were double deck; and the remainder, amounting to 38.8 per cent. were of various capacities, probably mostly 25-passenger. The trend to the use of the larger single deck vehicle seems to be pronounced throughout the industry, but it is unfortunate the 25-passenger was not listed so as to show this trend more definitely. The method of determining the capacity or size was by survey or estimate of traffic requirements.



The Man Standing Like A Traffic Cop Waves His Hand at the Little White Truck With the Hoisting Crane, and the Poles Move Faster Than They Did During the War With Russia After Them.

As a general rule no change is made in the size of vehicle operated at different periods of the day, because usually the trouble and cost of making the change would wipe out any economies that might result from the operation of a smaller vehicle during the time of lighter traffic.

One operator reports "Equipment is kept standard throughout the entire day. Riding habits permit this and the psychological effect on passengers through changing equipment during various periods of the day would prevent such a procedure unless savings were particularly large."

About 50 per cent of the operating companies reported that they make a practice of fitting particular types of equipment to particular types of service or to demands of service, varying their purchases as to types and sizes to the particular service required.

One very interesting point brought out by the questionnaire was the rather low results in passengers per bus mile prevailing on many routes. Under urban operations the maximum number of passengers per bus mile carried was 17.3; the minimum 0.37 and the average for 40 companies operating such service, 3.75. The average seems to be rather low, a result probably of the fact that many of these bus routes are feeder lines into sparsely settled territory. The interesting point is on many of the routes showing a low passengers per bus mile a large size vehicle is

A Rare Old Picture of Mack No. 1, the First Bus Built in America. If You Have Ever Lived in Brooklyn, N. Y., You Remember This Vehicle in the Prospect Park About 1901.

being used. In several cases with the passengers per bus mile below this average double deck buses were being operated.

The length of the route is a factor that tends to reduce the passengers per bus mile. Usually a bus or car is loaded only once on each trip. For a certain size vehicle therefore, the passengers per bus mile is inversely proportional to the length of the route. In some of the cases referred to, however, the length of the route is comparatively short, and the low passengers per bus mile indicates a load factor so poor for the size vehicle used it is likely to react against the financial success of the operation.

Of course there may be conditions that make it desirable or necessary to use a large vehicle for light traffic, but there is an indication from the replies to this question that more study should be given to the subject of the application of the proper size vehicle, and that economies might be realized by using a smaller and therefore cheaper vehicle under some conditions.

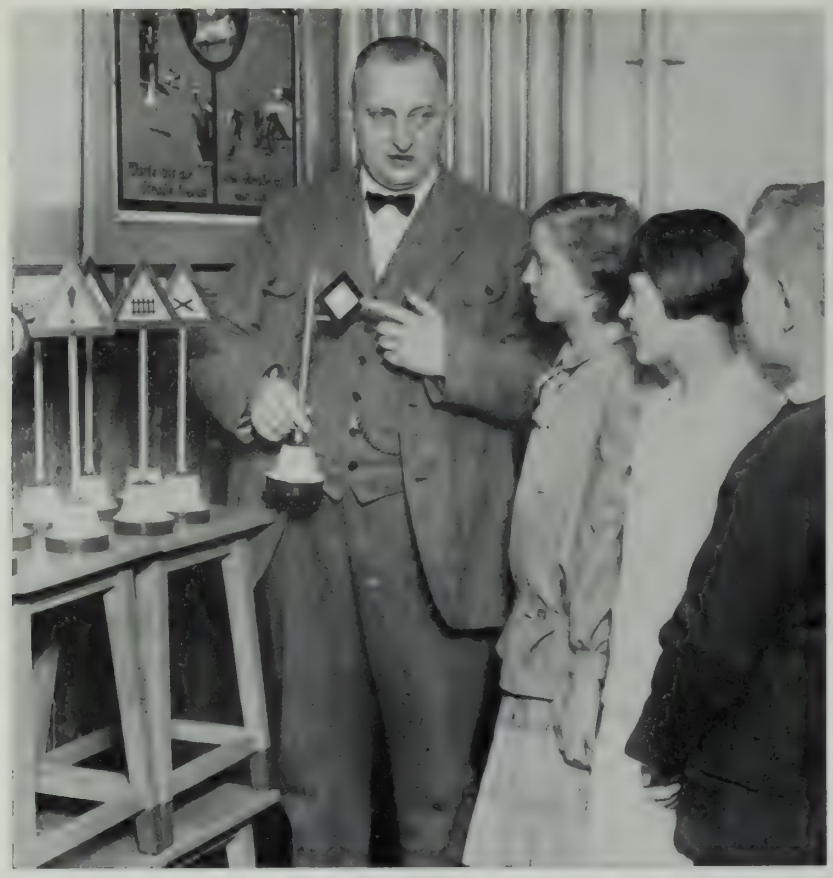
Under the suburban operations the maximum number of passengers per bus mile carried was 4.31; the minimum, .040; and the average for 7 companies operating such service was 2.25. Under interurban operations the maximum was 12.0; the minimum, .21; and the average for 11 companies operating such service was .268. The passengers per bus mile would naturally be smaller than on urban operations because the load must be limited to the seating capacity of the vehicle, but this is compensated for by the fact that the fare is usually based upon the length of the ride at 3c to 5c per mile.

It is not possible to make very definite conclusions from the data received on passengers per bus mile because this unit is not entirely comparable between different routes. It would have to be classified by the size of the vehicle and length of the route. A more interesting comparison might be made by obtaining a report on the passengers per seat mile per mile of route.

In Germany Children are Taught Things They Ought to Know About the Railroads and the Highways of Their Home City and Country. Schools in Berlin are Teaching Transportation, a Fine Suggestion for This Country. Herbert Photos.

The use of the bus for furnishing service supplementary to electric railway service was the first general application of this new transportation vehicle by electric railway companies and seemed to furnish the greatest field for its use. All of the 52 companies replying to the questionaire reported using buses for this sort of service. Such service is installed to take care of the needs of the community served resulting from growth and expansion. It is sometimes at the railway rate of fare with the standard arrangements for transfer. In other cases a higher fare is asked either with or without transfer or with an extra fare for transfer. The study for the necessity of such routes supplementary to the existing street car routes and the decision as to whether or not to furnish the additional service is fundamentally independent of the kind of vehicle, whether car or bus, with which such service is to be supplied. It usually happens, however, that where the new territory to be served is not thickly populated and the traffic density is light and the load factor poor, the bus will show a lower overall cost per passenger hauled than a street railway extension because of the smaller investment required and lower operating costs due to the fact that a small sized vehicle can accommodate the traffic.

Supplementary service consists principally of feeder lines, cross connecting lines and additional main lines. The feeder service is for the purpose of extending from existing car lines into new territory. The gross connecting lines are for the purpose of connecting existing



This is a German School Teacher in Berlin Showing the Pupils the Various Street, Highway, and Railroad Signals to be Encountered While Traveling in any Part of Germany. Herbert Photos.

car lines so as to provide a shorter and more direct route for passengers. The object is a saving in time, a greater convenience to patrons, and perhaps a reduction in the length of haul or in the amount of travel into the congested districts. The additional lines are usually for the purpose of filling a gap between existing car lines where the distance to be walked to the existing lines is too great for convenient or attractive service. The object is usually to supply a more convenient service to that portion of the community and to induce additional patronage.

Under supplementary service might be included the operation of buses parallel to street car routes and scheduled either with the cars or independent of them where the railway fare and transfer privileges are in effect. Such service is often supplied as a result of independent competition and this is usually the only justification for such service.

The combination of bus and street car is a recent development. In this sort of service the bus is operated on the same streets as the car line but the two vehicles parallel each other over only a portion of the route. For this portion of the route one of the vehicles, the bus or the car, will handle the local traffic, making all stops, and the other vehicle, which has the longer route, will operate as express making infrequent stops. It gives the same results as a four track railway operation without the expense and difficulty of operation for a four track installation.

In several cases now in operation, the street car route begins at a point a considerable distance from the downtown section. From the beginning of its route it makes all local stops. At a point where the street cars have become well filled on a reasonably close headway, the bus route begins. From this point down to the congested district the street cars operate as express vehicles making only one or two stops per mile, the bus operating as the local vehicle making all stops. The express stops of the street car coincide with local stops of the bus and there is a transfer arrangement for passengers to leave the street car and change to the bus if they wish to reach a stop between the street car express stops. In the business district, of course, both vehicles make all stops again. For the consideration of such an operation there must be a heavy line operated on a fairly close headway through wide streets where there is ample room for street car and bus to pass each other. To be justified the use of the bus as the local vehicle must make possible a sufficient speeding up of the street car on the express run so as to save sufficient car hours to pay for the cost of operation of the buses on heavy traffic service. The complete report, covering 66 pages, may be obtained from the American Electric Railway Association, 292 Madison Avenue, New York.

The Speedy Motor Car

Fewer automobile accidents would occur if motorists had a full realization of the tremendous ground they cover, even within the legal speed limit.

A table, reducing speed to feet traveled per second, follows:

10 miles an hour covers 14.66 feet a second.

15 miles an hour covers 22 feet a second.

20 miles an hour covers 29.33 feet a second.

25 miles an hour covers 36.66 feet a second.

30 miles an hour covers 44 feet a second.

35 miles an hour covers 51.33 feet a second.

40 miles an hour covers 58.66 feet a second.

45 miles an hour covers 66 feet a second.

50 miles an hour covers 73.33 feet a second.

Both Are Noisy

Automobiles are competing with the stork, in the opinion of Dr. Harmon P. B. Jordan, superintendent of Providence, R. I., Maternity Hospital. The city birth rate, he finds, was lower last year than in 1925, and probably will be lower this year than last. Some of the decrease, he believes, may be accounted for because many persons, unable to afford both automobiles and children, prefer automobiles.

He Who Hesitates is Safe

F. M. Metcalfe, Supt. Safety, N. P. Ry.

A railroad crossing is a good place to hesitate, particularly if you are driving an automobile. It is the unhesitating fellow who creates all the hullabaloo about the grade crossing hazard. Hesitate long enough to make dead sure you cross safely and you have solved for yourself this much discussed problem. A railroad crossing in itself isn't dangerous. The danger comes wholly from the heedless way people use it.

The Careless Motorists

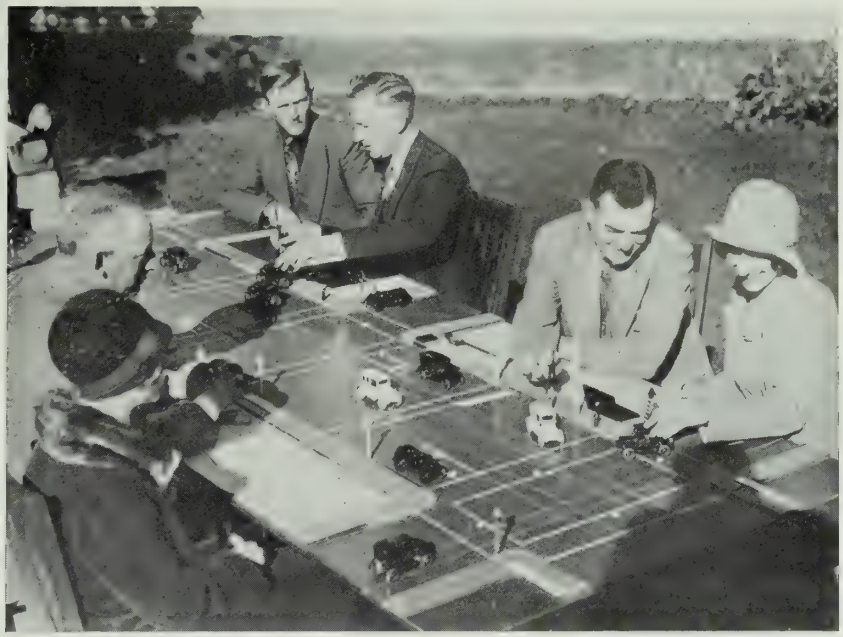
The American Railway Association has issued the following statement on "The Automobile at the Railroad Crossing" as part of its annual summer campaign to reduce grade crossing accidents:

In the United States 22,046,957 automobiles are registered. There are 232,755 railroad-highway crossings.

In 1926 there were 2,492 persons killed and 6,991 injured at railroad-highway crossings. In the same period 20,819 were killed and 600,000 injured in automobile accidents upon our highways.

The elimination of railroad-highway crossings at grade would end crossing accidents. Generations of time and 19 billion dollars would be involved in such a project.

1 fatality at railroad crossing to 11,201 cars.
1 fatality on highway to 1,001 cars.
1 injury at railroad crossing to 3,381 cars.
1 injury on highway to 39 cars.



The Miniature Set of Streets and Motor Cars Used by the Motor Vehicular Department at Los Angeles in Testing Applicants for Drivers' Licenses. International Newsreel.

All public crossings are marked by crossing signs. Many have advance warning signs.

There were 202 persons killed and 1,430 injured by running into sides of trains last year. Automobile accidents at railroad crossings resulted in the death of 50 and injury to 69 passengers and employes **on trains.**

Railroad enginemen are trained, selected, disciplined.

Are automobile drivers — — — ?

Humors of the Law

Connecticut has a windshield wiper law, which says all motor vehicles except motorcycles must have windshield wipers.

Albert Rubenstahl had a truck, but no windshield wiper. As a matter of fact, there was no windshield on the truck to be wiped.

There was the windshieldless truck and there was the law. The law won. "Five dollars and costs," said Judge Deming in town court at West Hartford. Albert is in the market for a wiper.

Statistics and Accidents

Some men simply can not see much if any value in any work except their own. "In a safety conference, recently," said Dr. M. O. Lorenz, director, bureau of statistics, Interstate Commerce Commission, speaking before the National Safety Council at St. Louis, "I heard a gentleman ask whether statistics had ever saved a life; and he suggested that the reduction in accident rates has resulted from the efforts of safety engineers and not from statistics. I submit that this view shows a misconception of the purpose of statistics in relation to safety work. One may discover from casual reading of the newspapers that there are frequent deaths at grade crossings; but it is only after statistics have been compiled that one can make the general statement that of the 7090 persons killed in connection with the operation of steam railways in 1926, 2388, or 33.7 per cent, were nontrespassers at grade crossings and 2623, or 37.0 per cent, were classified as trespassers on the right of way; so that, taking these two groups together we may say that 70.67 per cent of the railroad fatalities occur because people, other than passengers or employes on duty, are on your right of way at the wrong time. Such facts show that for the most part the reduction of the number of accidental

At One End of the New Holland Vehicular Tunnel, New York City to Jersey. Wide World Photo.

deaths in railroad operation is one that requires the cooperation of the public and is not merely a question of care in operating the railways.

"The 2623 trespassers killed in 1926 included 196 children under 14 years of age and 255 young persons from 14 to 21 years. The majority of the trespassers killed are not hoboes. Surely, equipped with such facts, you can make a stronger appeal to the public to cooperate in preventing such accidents, than if you simply read in the newspapers here and there about persons struck by trains.

"There were, at the close of 1926, 27,847 protected and 206,433 unprotected highway grade crossings with steam railroads. It seems hopeless to make them all fool proof, but doubtless there are thousands of dangerous crossings which would be eliminated or more adequately protected next year if the funds were available. Here is a magnificent enterprise which requires the cooperation of the railroads, the newspapers, the school teacher, the legislator, the inventor, and the rest of the public.

"Twenty years ago steam railroad operation involved about 10,000 fatal accidents annually. In recent years, notwithstanding an increase in mileage and a great increase in the volume of business, the annual fatal railway accidents have been reduced to about 7000, a saving of 3000 lives annually as compared with the conditions twenty years ago. This improvement, too, has been mostly since 1917, that is, during the period when safety work has been emphasized.

"Turning to the record of injuries, we note that the number of railway passengers injured annually is now about one-half of the number reported twenty years ago, but for employes and other persons the total number of injuries reported has increased. Per 1000 employed, the number of employe injuries for all classes is greater now than twenty years ago, although for trainmen the accident rate has declined. It is in reducing the nontrain injuries, or those resulting from the use of tools and machinery, from falling, and from handling heavy objects, that you are doubtless expected to make a most striking advance in the next few years."

The New Holland Tunnel

The long awaited Holland vehicular tunnel under the North River has finally been completed and turned over to the motor driving public. The governors of New York and New Jersey broke the first earth for this tunnel November 12, seven years ago. The opening of the tunnel marks a new era in vehicular traffic and brings to realization the dream of men who sponsored the undertaking as a means of relieving traffic congestion between the two states.

The tunnel from the Jersey end to the New York end measures 9,250-feet, while the section under the river is 5,480-feet long. There are two roadways each 20-feet wide, one for eastbound and one for westbound traffic.

A daily capacity for the tunnel is decided upon and officers are to be on duty at all times to see that this is not exceeded. Police booths are placed at regular intervals in the tunnel with regular traffic lights to govern the flow of traffic. No horse drawn vehicles are to be permitted in the tunnel, and special rules have been drawn to govern the types of machines.

Entering the Holland Vehicular Tunnel at the Broome Street, New York, End. Note the Many Toll Booths. At These the Drivers Paid The Toll Before Beginning the Voyage to Jersey City. International Newsreel.

Business Outlook Good Says Hoover

Prosperity Not Due to War

By W. E. Hopkins

BUSINESS men everywhere have special confidence in whatever Secretary Hoover says about the future outlook, industrially and commercially, because the secretary, as time and experience have shown, is influenced by political considerations less than any other man in the government. Despite all the figuring and forecasting of the self-appointed and self-satisfied president-makers the really important business men have come to regard Hoover more nearly independent in expression than any public official of his rank in very many years.

Particular faith is placed, therefore, in the optimistic report for 1926-27 just issued by the secretary of the department of commerce. Some of the outstanding features of the report follow.

"The fiscal year ended July 1 continued the economic progress which has now been characteristic of American industry for six years. It exceeded all previous records in volume of production and consumption, and in the physical quantity of exports and imports. There was very little unemployment, except during a moderate recession near the end of the year, and the rate of real wages remained higher than anywhere else in the world or than at any other time in world history. The high prosperity of the year did not represent merely an upward swing in the business cycle but was the result of that general and permanent progress."

"The most conspicuous gains shown as compared with 1925-26 are in mineral production, freight transportation, output of electric current, and sales of 5 and 10 cent stores."

"Since the close of the fiscal year prices of farm products have advanced materially, the average for August and September, 1927, being 6 or 7 per cent higher than during the corresponding months of the preceding year. Advance has been particularly conspicuous in the case of cotton as a result of a much reduced crop. As the prices of other commodities had meantime declined somewhat, the relative position of farm products has materially improved. On a pre-war base the index for them now stands quite as high as the average for nonagricultural articles.

"The situation of the farmer has an important bearing on the general trend of industry and commerce. The crops harvested in the autumn of 1926, constituting the main factor in the agricultural situation of the fiscal year, were in the aggregate the largest produced in our history with the exceptions of 1915 and 1920. According to estimates of the department of agriculture the combined value of crops and animal products, deducting crops fed to animals, used for seed and waste, amounted to $12,080,000,000 as compared with $12,670,000,000 the year before."

"New construction undertaken in the fiscal year 1926-27, amounting to some seven billion dollars in value, constituted a powerful factor in maintaining general business activity and prosperity.

"The value of contracts awarded was approximately the same in 1926-27 as in 1925-26, and exceeded the average for the two years ending June 30, 1925, by no less than 37 per cent.

"The fiscal year 1926-27 witnessed a continuation of the relatively large program of construction of industrial, commercial, and public buildings. There has been nothing to suggest extravagant expansion of industrial plants such as characterized the immediate post-war boom."

"The exports to all the continents and great trade regions of the world were greater in the last fiscal year than the year before except for a slight decrease in the value of sales to Latin America, a decline probably less than that in the prices of the commodities sold. The less favorable figures for Latin America were due largely to the relatively low price of sugar, reducing the buyer power of Cuba, and to disturbed conditions in Mexico.

"The excess of exports over imports (the so-called 'favorable balance of merchandise trade') in 1926-27 was $716,000,000, a very much greater figure than that of the year before but somewhat greater than the average of the five fiscal years 1922-1926."

"The steady expansion of the foreign trade of the United States, the promotion of which is one of the principal functions of the department of commerce, must furnish ground for satisfaction to all classes in the community."

"It is true that the United States is exceptionally self-sufficing. Possessed of a great variety of resources and a still wider range of manufacturing industries, it needs to import a smaller proportion of its consumption than most countries of living standards in any way comparable with our own. So, too, our industry finds within our own

borders the larger proportion of its market. Nevertheless, foreign trade is a highly important element in our national well-being. Export makes it possible to use our resources and energy to greater advantage; by widening the range of markets it gives to industry greater stability in output and thereby makes employment more secure."

"There is little doubt that manufactured goods will continue to gain in relative importance in our export trade. The growth of population in our own country will continue to call for the consumption at home of a larger and larger proportion of foodstuffs and raw materials produced by our farms. World demand for agricultural products is limited, since these are chiefly necessities; the demand for manufactured products is not so limited; it grows with every increase in buying power and standards of living."

"The value of our exports to Europe in 1926-27 was 77 per cent greater than the pre-war average (1910-1914). Taking account of the change in prices this represents an increase of perhaps 35 or 40 per cent. Our exports to all other parts of the world taken together increased during the same period by 215 per cent in value, and by 125 to 150 per cent in quantity."

"There is every reason to believe that American export trade will continue to grow along with the expansion of our production. The causes at work are such as may well be expected to continue; they are, moreover, cumulative in their effect. Not only is the United States likely to increase its capacity to produce and to maintain its ability to compete with other manufacturing countries in world markets, but there is also reason to believe that world demand for goods will expand, provided always that peace is maintained. The same causes which are tending to build up productive capacity and advance living standards in the United States are at work all over the world."

"For decades past there has been vigorous competition in international commerce. That competition has not prevented the expansion of the trade of every country save so far as the war intervened. Competition will continue. Our producers and exporters must be on their mettle, but if they put forth proper effort, we shall be able to maintain our share of the steadily expanding commerce. In the broad view, the progress of every country of the world is of benefit to every other country."

"The progress in efficiency is brought into sharp relief by comparing the increase in the product of agriculture, mining, manufactures, and railways with the increase in the number of persons employed in these branches. The addition of 140 per cent to their output between 1899 and 1925 was achieved by adding only 34 per cent to the number of workers. This means a gain in production per worker amounting to nearly 80 per cent. The increase has been shared by all the major branches. It is scarcely less conspicuous in agriculture than in manufactures and railway transportation, while the higher gain in mining has been due almost solely to the extraordinary expansion of the petroleum industry, in which the value of product per person employed is exceptionally high. It may be noted that the increase in output per worker for the four branches combined is greater than for all but one of the individual branches. The reason is that there has been a relative shift of workers from agriculture to other fields in which the amount of capital and power employed is greater so that the output is higher than in farming."

"The decline in the number of employes in agriculture, mining, manufactures, and railway transport is far from being an indication of business depression or of lack of employment. It is due to the advance in income which enables the people to devote a larger share of effort to services of distribution and to professional and personal services, reflecting a higher standard of living. If the reduction in workers in these four branches had meant unemployment, the great gain in output would have been impossible, since it could not have found a market."

"The causes which have made for the rapid advance in American industry are fortunately of an enduring and cumulative character. The idea that our present high prosperity is the result of the World War is wholly without foundation."

"All these specific factors in the prosperity and progress of the United States, as well as the more basic factors of abundant natural resources and a capable population, are of such a character that we may well hope for continuance of our economic progress. Indeed, these favorable factors tend to work cumulatively; each forward step makes another forward step easier. The fact that our national income is already high makes it possible for us readily to add to our capital equipment, to improve educational standards and to carry further scientific and technical research."

Texan Farmers Lead

Farmers of Texas own more automobiles than those of other states, the rural registration shows. They own 262,000 motor cars and 23,000 motor trucks.

Roads Increase

Compared with 153,530 miles of surfaced highways in the United States in 1904, there are more than 521,915 miles of this type road at present.

Editorial Comment

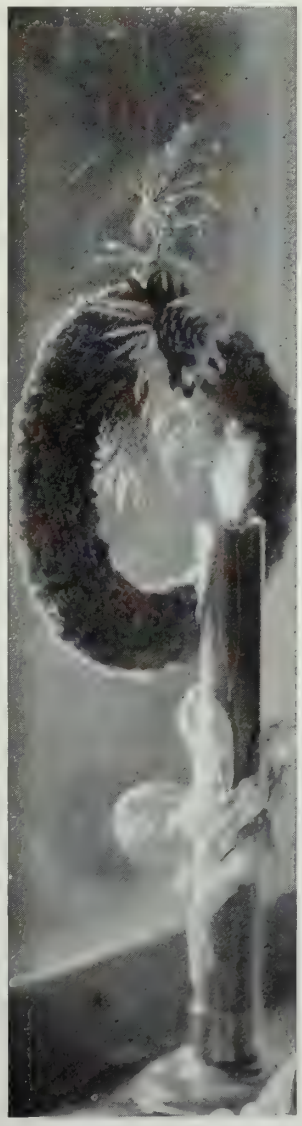
Christmas

IT USED to be said, long years ago, that the chief charm of Christmas was its simplicity. Arthur Reed Kimball said this particular holiday is a festival that appeals to everyone because everyone can understand it. "A genuine fellowship pervades our common life," said he, "a fellowship whose source is our common share in the gift of the greatest Life which was given to the whole world."

This is a fine thought. But Christmas isn't nearly so simple as it used to be. Nothing is simple any more. For railroad men the chief charm of Christmas must rest in the fact that it is about the only thing remaining safely beyond the irritating purview of the regulating authorities. There seems to be nothing about it in any of the 25,000 statutes, federal and state, affecting the conduct of transportation.

With children reading daily papers filled with Christmas advertising; with steam heat, gas-log fireplaces, or no fireplaces at all; with Santa Claus appearing in person in half the big stores of the cities and towns, is there any wonder that the old simple faith of the children in the beautiful deception of centuries gives way to the severe strain on credulity?

But even if the old simplicity no longer exists Christmas still may be very beautiful because it gives valid reason for a little more generous consideration throughout the Christian world, a season of merry-making circumscribed only by the Eighteenth Amendment; a real excuse for handshaking and cheerful words, for more kindly actions than are a part of every day life, a sensible, orderly Christmas.



If you wish you can still know all the old delights of Christmas as you knew them in your boyhood. You can go out into the country, among the trees and the snow—and even in the semi-tropical climate of California it is possible, in two or three hours, to find plenty of snow, real cold weather, actual fireplaces, and stone chimneys down which Santa Claus may slip his load of presents. And this is the only real, honest-to-goodness Christmas. Meanwhile, if Fate confines you and yours to a city with all the tiresome conveniences of modern living,

God rest you, merry gentlemen, let nothing you dismay.

It is a good idea, along about Christmas time, to let down a little in the strain of business wherever possible. Forget just as much as you can the irritating animosities that seem to enter the lives of even the most cheerful men and women. Give thought if you can—and who can not?—to the family. The railroad will not blow up because of your absence for a few hours. If, perchance, you are a trainman your Christmas may have to be punctured a trifle. You may have to eat your dinner earlier or later than will be the case with men who stay at home. If this be your fate you will be called upon to exercise rare patience. Some comfort will be found in the reflection that the human beings in the cars behind you are living the same disappointment and perhaps feeling it much more keenly because of its novelty. Christmas, much more than New Years Day, is a time for expansiveness, of geniality, of good cheer. On the first day of the new year you probably will regret the boneheaded things you've done in the last 12 months, and resolve to show common sense in the forthcoming year. At Christmas you have only to remember Rule G, and go ahead for a good time.

That Tiresome Hundred

We all have a good bit of respect for a man who has been on this earth for 93 years, especially when his career has been so important and productive as that of Chauncey M. Depew. But there is a limit in all things, and in Depew's case it has been reached. The story about the hundred dollars he is said to have deposited in somebody's bank 60 years ago and then forgotten all about until the bank appealed for help in caring for the thousands into which it had grown, is the last straw. If Mr. Depew tells it again we shall write to our congressman or

misspell his name when we use it, which we hope we may do many, many times before he is an old man. We are tired of that story.

If you chance to have a bachelor uncle in your family who visits you occasionally and spends the time telling your wife how you ought to be saving money, and how extravagant you are in your personal affairs you will understand the deep and sincere loathing we have for any such yarn as this about Mr. Depew's hundred dollars. We hope never to see it again.

Stand By for a Boom

The railroads have been warned officially that a business boom is approaching, an unprecedented upturn in commercial and industrial affairs that will make the prosperity of 1925 and 1926 seem like a depression.

The forecast comes from a pretty careful and authentic source — Virgil Jordan, chief of the research bureau of the National Industrial Conference Board, an organization whose only possible motive in making such an announcement is the perfectly plausible wish to have adequate transportation when it is needed. Without this transportation there can be no boom for very long, and not much of anything else except a slump.

Mr. Jordan issued his warning to the Railway Business Association in its annual meeting in New York, the middle of last month. What he said was, of course, based on the results of the conference board's investigations of business conditions, plans, and prospects throughout the country. These investigations are cold-blooded things, dealing solely with facts as the research gentlemen find them. If they were anything less they would soon put an end to the conference board.

The unprecedented expansion of business, for which conditions are favorable, Mr. Jordan told the railway equipment and supply men, "is likely to strain our transportation facilities and credit resources to the limit, and put the self-control of business men and the powers of the Federal Reserve System to a real test to prevent serious inflation and a subsequent slump."

A Libel on Chickens

Writing in the Timken Magazine about accidents somebody says, "Even a fool chicken, the dumbest creature on earth, rarely tries to cross a road in front of an automobile."

This doesn't tally with our driving experience, and it certainly will be news to farmers and to thousands of motorists. We believe a survey will show that chickens, like cows, wait patiently by the roadside for hours until a motor car is near, and then meander thoughtfully and slowly across the highway. Furthermore, a chicken is not the dumbest creature on earth. This classification is reserved for motorsists approaching railroad grade crossings.

Beyond the Cascades

That part of Washington which lies behind the Cascade Mountains will never develop properly until that natural barrier has been pierced by a tunnel equivalent to a water grade. The Interstate Commerce Commission and all the laws possible to devise in an effort to overcome the age-old contention over preferential railroad rates will never build up that hidden part of the Northwest. Just as long as goods have to be hauled up the mountain grades and then taken down grades as severe and dangerous, just so long must someone pay the bill. The proposed Cascade tunnel would wipe out the cause of this troublesome quarrel. But of course it would not change human nature. Portland and Seattle still would have something to wrangle over.

But, Imagine What Lincoln Missed!

One of the late biographies of President Lincoln says that at the peak of his career as a lawyer the position of general counsel for the New York Central at $10,000 a year was offered him. That was a big salary in Lincoln's day but it isn't anything much to write home about now. The important reflection is that if he had taken the job the history of the United States might have been vastly different. We don't understand why he turned it down—no commissions, no valuations, no recaptures, no Brookharts—just $10,000 a year. The story doesn't ring true.

More Bait for Farm Votes

Senator Walsh of Montana says of the St. Lawrence Ship project:

> I am taking a deep interest in the St. Lawrence. The development of that waterway would reduce the cost of transportation of wheat from the Great Lakes to Liverpool by from 8 to 10 cents a bushel. It would save the farmers of Montana alone approximately $5,000,000. Montana produces 70,000,000 bushels of wheat.

The St. Lawrence waterway will never add one cent to Montana farmers' incomes. Wheat prices are based in western states, where the grain is produced, on the freight rate to the primary market. No farmer knows whether his grain is going to Liverpool or Minneapolis. He doesn't sell for export. Farmers have never worried their heads about the St. Lawrence waterway because the smartest of them know it is a vain political hope created by exporters and officeholders in public service.

In only one possible way might the St. Lawrence River help western farmers. It might help to keep in their own territory more freight cars suitable for wheat hauling which frequently are used for storage purposes in the eastern part of the country.

To be useful to wheat farmers a waterway would have to be farther west than the St. Lawrence. And it would have to be open to navigation when they needed it. Rivers and lakes have a way of freezing in the winter. Then, too, the eastern half of the country certainly would enjoy being taxed to build a waterway to help western farmers get a better price for their wheat. Isn't Senator Walsh giving his farmers credit for having very little common sense?

Railroads Praised by Hoover

When business men—and this includes railroad men also—are praised by Secretary Hoover they like it. They like it because they know the secretary has a world grasp of important things, a world-standing as an efficient engineer, a man who says something worth hearing when he talks; and this is not a common trait in this country.

Secretary Hoover's references to the carriers and shippers in his annual report for 1926-1927, just issued, describing the very remarkable accomplishments of the railroads in the last fiscal year, are encouraging, but particularly the section dealing with the fine results in transportation rightly to be attributed to cooperation between railroads and shippers.

"The increased prosperity of the railways in the last few years," says Secretary Hoover, "has gone hand in hand with steady improvement in the services rendered to the public. The chronic car shortages of former years have been overcome. The proportion of rolling equipment in bad order, both cars and locomotives, has been greatly cut down; in this respect the fiscal year 1926-27 marked the most satisfactory situation reported for many years. The tonnage per train has been increased; the average train in 1926-27 carried 786 tons of freight as compared with 656 in 1922. More important still from the standpoint of the general public welfare, delays in the movement of traffic have been greatly reduced. The expedition of railway service has reacted favorably upon the entire economic structure. It is estimated that the rapidity of freight transportation is now from 30 to 40 per cent greater than at the close of the war.

Safe From Interruption Any Way

News comes from Curtiss Field, N. Y., two Falcon observation planes have just been built for the especial use of F. Trubee Davison and Hanford MacNider, assistant secretaries of the navy and war, respectively, for aviation. The report adds, naively, that the rear cockpits of the planes contain folding mahogany desks on which the secretaries may study maps or write speeches. There seems to be something sinister about this last paragraph. Admiral McGruder probably might tell the two secretaries about speech writing, especially when up in the air.

Good Times, Says Henry Ford

"The outlook for 1928," says Henry Ford, "is simply a matter of production. Production means the consumption of materials and labor. All production in this country is either holding its own or increasing, and I believe that it will continue to increase during the next year. That will mean greater distribution of money and greater purchasing power.

"The biggest thing any industrial enterprise can do for the country is to create more business, more work and greater opportunities for improving the national living scale. That was why we brought out our new car. It has been designed to meet conditions as they will be during this coming prosperous period."

You may not think highly of Mr. Ford's opinions on history, coinage or peace negotiations, but you must admit he usually has the right slant on industry.

He's At It Again

Senator Brookhart of Iowa announces he is framing a bill for government ownership of the railroads. He will introduce and press it in December, and declares it will have the solid support of the Progressives, whoever they are. He made two significant statements recently in connection with his proposed measure. One was that it would have powerful support from an unsuspected quarter, which, he said, would be a big surprise.

Perhaps the senator refers to the bondholders to whom he proposes to give tax-free government bonds in exchange for their railroad bonds. This ought to make them happy were it not that the senator says he will squeeze the value of the roads down to 12 or 15 billion dollars. In that squeezing process he could hardly expect the stockholders to suffer all the punishment. When the bondholders learn just what the senator has in mind they probably will demur.

The senator is one of the group believing the legislative branch of the government, state or national, is or ought to be supreme, all powerful, and that any legislation which can be log-rolled or traded through congress or a state legislature, or which passion, prejudice or a seeming emergency causes to be enacted, must not and should not be questioned. He forgets or would ignore the Constitution and the courts. The fundamental doctrine that private property cannot be taken for public use without due compensation is overlooked. Senator Brookhart forgets the Fifth Amendment, apparently. That would stand in the way of an arbitrary legislative valuation of railroad property and prevent semi-confiscation.

The other significant remark, which is naive, to

say the least, was that politicians cannot successfully run the railroads; that they must be operated by railroad men. His bill, therefore, will provide for the government's acquiring the properties and then leasing them to railroad companies for operation.

His theory, of course, is that if the government can take them on a very low basis, paying for them with 3 per cent or 3½ per cent bonds, they could be rented out to railroad companies for operation upon low rates as not so much money would be needed to pay interest on the bonds and there would be no stock upon which to pay dividends.

But something always bobs up to spoil Senator Brookhart's plans. In this case he slips once more in overlooking the fact that the United States courts —not congress—will or would determine the value of railroad properties if they were taken over by the government.

Still one more slip. The senator forgets that if the government owned the roads the physical properties would no longer be taxable for state and local purposes. In 1926 railroad taxes in Iowa amounted to nearly seven million dollars. From 1916 to 1926, inclusive, the roads have paid that state $64,242,066 in taxes. Haven't the people, especially the farmers, benefited? Would it help the senator at home to be held responsible for cutting off this source of revenue?

Value of Transportation

The latest innovation in the transportation facilities of the railways of the United States is the "refrigerated milk tank car", which maintains a temperature of 35 degrees for the contents in the hottest weather, and thus guarantees the good condition of the milk.

A city in the heart of the agricultural district in Northern Iowa established a dairy service with Chicago, 350 miles away. A car of milk leaving this point by express every night at 10 o'clock arrives at Chicago at 7 o'clock the next morning, and is delivered immediately to a pasteurizing plant. There it is pasteurized, bottled and delivered about the city.

By these processes the Iowa farmer's milk is delivered in the best possible condition to Chicago consumers within 24 hours after milking.

The farmer receives about 5½ cents a quart, the railway company nine mills, and the milk retailers at Chicago 14 cents a quart, or slightly less in wholesale quantities.

A car, ordinarily, carries 50,000 pounds of milk. The farmers in the vicinity of Mason City who produce milk, receive about $1,250 a day for their product, an aggregate of $456,250 a year, while the other persons concerned in the distribution and handling receive an equal or greater amount. The railway company gets less than one cent a quart for its service.

The Chicago people have little to fear in connection with their supply of milk which for many years has been drawn from an area within 100 miles of the city when there is available to them railway service which will extend the possible area for production of their milk to a distance of 400 miles in all directions from Chicago. The benefits of this service are conspicuously apparent as they relate to the farmer but are as truly valuable to the entire population of Chicago as any service they receive.

As to Consolidations

Railroad executives opposed to compulsory consolidations ought to find what they need in the Parker bill which is to be taken up once more when congress convenes. This measure seems to have met the favor of most of the roads, but thus far no one except Colonel Thom, general counsel for the Association of Railway Executives, has come out publicly for it. Doubtless the railroads will be properly represented, as they always are, when the committees on interstate commerce in both houses consider the bill. What these committees do very likely will decide the fate of the measure because the average congressman is well satisfied to be told what to do in technical matters.

Colonel Thom is chairman of the railroads' law committee in Washington. His suggestions, received in the annual meeting of the executives in New York, the middle of last month and approved by the association, were that if the Transportation Act of 1920 is to be amended, the basic principles of the Parker bill should govern any such amendment and that the railroads should be permitted to consolidate along business lines, rather than along lines suggested by some regulatory body. Such consolidations, of course, would be subject to the approval of the Interstate Commerce Commission which would be relieved of the task of working out alliances for the carriers. As to minorities, always a paramount difficulty in the path of consolidation, the law committee suggested that stocks held by protesting minority groups should be appraised by the courts and taken over by the controlling companies.

Having failed to present an acceptable plan itself, as contemplated by the Transportation Act, and disapproved those prepared for its consideration, the Interstate Commerce Commission can help along the consolidating of railroads by letting the executives and the world in general know just what, precisely, it is likely to approve. No one knows. Up to the present, after seven years waiting, and after pretty nearly everyone except Colonel Lindbergh has made a plan or two, all the country and the executives of the railroads know is that the commission will not approve the Nickel Plate merger, the Loree combinations or the Wheeling & Lake Erie schemes. The

commissioners certainly must have some idea of just what they really would like to see done in the lifetime of men now on earth. They ought to let the public and the executives in on it. To let a group of railroad men and financiers work at great expense for a year or two getting up a consolidation, the details of which have been as private as the life of a goldfish, and then to disapprove it, ought to come under the beneficent provisions of the Eighth Amendment forbidding cruel and unusual punishment.

Buses in Minnesota

Motor buses in Minnesota, in 1926, carried more than 12,000,000 passengers and collected $4,627,000 for services rendered. A total of 402 vehicles, of which only 119 were confined to local transportation, operate on 4,870 miles of roads throughout the state, which have been assigned by the commission. In addition to the transportation service rendered by the buses, their operation has benefited the state in the amount of $219,000 paid for vehicle licenses and $64,000 for gasoline tax.

The Editorial of This Edition

WHEN the railroads applied to the Interstate Commerce Commission, in May, to reduce the rate on canned goods from Pacific Coast ports to central states points between Colorado and Pittsburgh, Pa., from $1.05 to 90 cents a hundred pounds, the petition was denied. The commission did agree, however, to let the roads cut the rate to 98 cents as soon as the schedules can be prepared, which is just about equal to nothing from a competitive point of view. For the benefit of those who might not understand why a railroad wished to have a lower rate it is necessary to explain that this action, if permitted, would give the transcontinental lines a chance to compete with water-borne traffic which at present cuts into freight earnings with increasing seriousness.

One of the first interests to intervene before the commission in opposition to the proposed reduction was the Mississippi-Warrior River Barge Line, owned and operated by the United States government. This barge line handles a large amount of the coveted traffic from the Pacific Coast reaching it through the Panama Canal. Other protestants were traffic organizations in the Southwestern and Atlantic Coast territory, all of which benefit by reason of the coastwise shipping.

Unusual interest attaches to the action of the commission in the canned goods case because of the singularly nice adjustment with which the decision fits into the government's plans to extend its own competition with the transcontinental railroads. These plans, according to the latest reports from Washington, contemplate asking congress for permission to increase the capital stock of the Mississippi-Warrior River Barge Line by $50,000,000.

It is important to remember that the government, through the Interstate Commerce Commission, says what the railroads shall charge for hauling freight or passengers, but that shipping interests on the seas and rivers make their own rates except on traffic moving partly by rail and partly by water. It is not difficult to understand, therefore, just how the government, with money supplied by the people in taxes, can build and then extend a water service with uncontrolled rates demoralizing to railroad earnings. If such water service benefited a large part of the country's citizenship it might be possible to excuse the discrimination. But this the barge lines do not do at any time, and they never have — not, at all events, since railroads came into the picture.

When the government took over the railroads in 1917 the Control Act authorized the President to spend whatever might be necessary to operate transportation facilities on the coastwise and inland waterways of the country. When the railroads were returned to their owners, provision was made that the government should continue in the business of water transportation. The reason given was that if the government should prove barge lines are profitable, private capital would readily enter the field.

The Inland Waterways Corpn., the government agency formed to carry on this enterprise, established barge lines on the Mississippi and Warrior Rivers. Some millions of dollars were spent in acquiring the latest type of equipment and other facilities. In order to attract traffic a scale of rates about 20 per cent below rail rates, was adopted. The help of the Interstate Commerce Commission was invoked to force privately owned and operated railroads to establish joint routes and joint rates, with these competing government owned and operated barge lines.

Despite government aid, however, the enterprise lost money for several years. Recently small "profits" have been shown, but in considering these one must remember the corporation has not had the overhead and carrying charges a private corporation would have to meet.

Apparently private capital is not willing to risk $50,000,000 in this venture, so pressure is to be brought to have the money raised by taxation.

What President Coolidge thinks of the situation may be judged from the statement that he "understands the barge lines were to be in the nature of demonstration lines. They are experimental to determine whether it is possible to operate transportation of that nature successfully. The President does not understand that it has been the intention of congress to put the United States government definitely into

the transportation of freight on our inland rivers. His understanding is that the law provides that these experimental routes shall be put in operation and disposed of by the government under the general policy that that work can be done better by private initiative than by the government."

The President has an uncanny way of getting right into the heart of this kind of proposal, but what he understands and what congress may do are quite different things. It is a situation worth watching by the railroad managers before, and not after congress acts. One of the executives, T. C. Powell, president of the Chicago & Eastern Illinois, has written an interesting letter about it addressed to General Ashburn, U. S. A., chairman of the board of the Inland Waterways Corpn. President Powell says:

"When Edward Chambers, director of traffic for the Railroad Administration, consulted me as to the latitude that should be given the Mississippi-Warrior service under the direction of the Railroad Administration, I urged him to extend the area of joint rail and water rates so as to include all the territory which could reasonably be benefited by the reduced operating costs of the barge lines.

"The word 'reasonably', of course, meant that this area must have some limitation, and that limitation, to my mind, is regulated by the value to the shipping public of the barge line service itself, and without respect to the possibility of inducing or forcing the all-rail carriers to reduce through rates in competition with the barge line.

"So far, the Inland Waterways Corpn. appears to have furnished a service which has been utilized by a number of shippers, and when I say that it 'appears' to have done so, I mean that my impression is based upon reports received from time to time from our traffic representatives.

"The present application for an additional $50,000,000 to increase the equipment and, presumably, to extend the operations of the Inland Waterways Corpn., is one which requires very serious consideration, because, in my opinion, it implies considerably more than contemplated in the Transportation Act, in which the commission is admonished and put on notice that it is the policy of congress, while promoting water transportation, 'to foster and preserve in full vigor both rail and water transportation.'

"The converse of 'vigor' is 'debility', and nowhere in the various laws, nor in the debates in congress; nowhere in the press, nor in the statements of private individuals, do we find a thought that there is in this country a desire or even a willingness to have a 'debilitated' transportation system.

"On the contrary, the words 'in full vigor' have a very expressive meaning, and congress very evidently chose them carefully to counteract any possibility that protected water transportation system would be permitted to break the rail lines which, although more vital to the United States, would otherwise be unprotected.

"The Transportation Act contains other references to water service, among which I find the following:

> "'Nor shall the commission have the right to establish any route, classification, or practice, or any rate, fare, or charge when the transportation is wholly by water.'
>
> "'In the case of a through route, where one of the carriers is a water line, the commission has the power to prescribe the maximum rates, fares and charges applicable thereto.'

"It should also be pointed out that the Interstate Commerce Commission has no jurisdiction over intrastate rail rates except as they apply to foreign commerce and except as they may detrimentally affect the just and reasonable rates fixed by the commission on interstate traffic.

"Congress has not only forbidden the Interstate Commerce Commission to attempt to regulate the all-water rates, but has also forbidden the rail carriers to meet in any competitive way an all-water rate unless the carrier is willing to accept the responsibility and burden of keeping such reduced rates in effect for an indefinite period, subject to the direction of the Interstate Commerce Commission.

"If the $50,000,000 or any substantial part thereof is expended in increasing facilities for handling tonnage over the present routes, or if a part or all of it is expended in establishing barge service on other inland waters not now completely served by any steamboat or barge company or private individual, I do not hesitate to say that I am very apprehensive of the effects of such extended operation upon the revenues of the rail carriers.

"It must be remembered this country already has gone through the experience of using the rivers, lakes and artificial canals to an extent greater than any other country.

"If further expenditures by the Inland Waterways Corpn. are necessary to increase and perfect the operations of an already successful institution and to supplement the operations of the rail carriers, there can be very little adverse comment, but I fear that this is not the underlying reason for the present request.

"Water navigation is necessarily limited, and while we talk of the great rivers in the United States, it is hardly necessary to mention the fact that these rivers are not continuously navigable throughout the year and will not be navigable to that extent until they have been canalized or, to speak more plainly, until they have been dredged and locked and provided with a supply of water to operate the locks at all seasons of the year."

After reciting the history of canals and rivers in transportation for many years Mr. Powell says:

"It seems to me that the successful operation and expansion of the Inland Waterways Corpn. will depend not upon the money appropriated but upon the method of operation, and particularly with respect to the relations between the Inland Waterways Corpn. and the rail carriers.

"Those who conceive that the purpose of the Inland Waterways Corpn. is to break down the rates of freight and to make the operations of the corporation obnoxious to the rail carriers are living in the past.

"I have never been antagonistic to the development of the inland waterways of the country nor to the operation of vessels on those waterways on a business basis, because I have always considered that the possibility of using an alternate differential water route or rail and water route removes from the minds of the public any fear of railroad monopoly. Of course, the idea of railroad monopoly at this time in the United States is ridiculous, but prejudices take a long time to dispel.

"Whether the Inland Waterways Corpn. continues to operate with its present capitalization or whether all or any part of the $50,000,000 is invested by the corporation, I believe the life of the operations will be short unless the broad purpose of the Interstate Commerce Act is kept in mind, because it must be remembered that congress undertook to do several things.

"To maintain the rail carriers and to insure to the rail carriers a reasonable rate of return, if possible, to carry out that plan.

"To utilize all reasonable methods of transportation in the interest of the people of the United States.

"To consolidate rail carriers to insure their permanency and to put them in such a position that they will be relieved of local disturbances and depressions.

"To prevent any secret arrangements or discriminations.

"To give the operators on the inland waterways a free hand to develop the commerce suitable for transportation on such waterways and, at the same time, restrain the rail carriers from stifling such operations.

"Finally, 'to foster and preserve in full vigor both rail and water transportation.'"

This is a pretty big country but is it big enough, and is the population large enough right now to support "in full vigor" transportation by steam and electric railways, motor buses and trucks, and eventually by air, and at the same time spend many millions for transportation by water, and all in the same territory? Maybe it is, but we doubt it. We doubt it as we doubt the paper profits in any business enterprise conducted by the government. The government should get out of business and stay out.

The President Urges Consolidations

Message to Congress Emphatic

By W. E. Hopkins

THE enacting of railway consolidation legislation at the present session of congress is brought to the front by the careful recommendation made by President Coolidge in his annual message to congress in which he urged that such legislation is absolutely necessary for the progress of the country.

"In order to increase the efficiency of transportation and decrease its cost to the shipper, railroad consolidation must be secured," said the President to congress. "Legislation is needed to simplify the necessary procedure to secure such agreements and arrangements for consolidation, always under the control and with the approval of the Interstate Commerce Commission. Pending this, no adequate or permanent reorganization can be made of the freight rate structure. Meanwhile, both agriculture and industry are compelled to wait for needed relief. This is purely a business question, which should be stripped of all local and partisan bias, and decided on broad principles and its merits in order to promote the public welfare. A large amount of new construction and equipment, which will provide employment for labor and markets for commodities of both factory and farm, wait on the decision of this important question. Delay is holding back the progress of our country."

While the President, in his annual message to congress at the beginning of the last session, urged the speedy enactment of consolidation legislation on the grounds that "it would be of great advantage," his recommendation this year is much stronger and un-

present at hearings. There is no doubtedly will do more to force the issue than anything that could be said or done by anyone else.

Despite the President's recommendation, however, there continues to be a feeling at the capitol that the session of congress now in progress will not see the final enactment of consolidation legislation. Both Chairman Parker of the house interstate and foreign commerce committee, and Senator Watson, chairman of the senate interstate commerce committee, announced recently that they expect to press consolidation legislation, and there is little doubt that the former will be successful in the house. On the other hand, there was absolute indifference to the subject among the members of the senate committee at the last session of congress, so much in fact that despite efforts of the chairman, it was difficult to get more than three or four of the 17 members of the committee to be indication of any change of interest so far at the present session.

Another stumbling block in the way of consolidation legislation this year is the fact that various senators, principally those recognized as members of the so-called radical group, have various amendments now up their sleeves to offer the very minute railway consolidation legislation is mentioned, and any such bill passed by the senate, in view of the composition of that body this session, necessarily would have to be of a compromise nature with the so-called conservative members doing most of the compromising. In view of that fact, there is believed to be little chance for the house committee which has been giving undivided attention to the whole question of railroad consolidations, and which probably knows more about the subject than any other body of men, to agree to any compromise radically modifying the bill.

According to Senator Watson, an early verdict on the question of whether that subject is to be brought before the senate this session will be reached. That there is pressing need for it, seems to be the predominating view. Senator Watson plans to have his committee consider proposed legislation prior to the Christmas recess with a view to determining without much delay whether a bill is to be reported.

The present efficiency in railroad operation was praised in the annual report of Secretary of Commerce Herbert Hoover just made public.

"The increased prosperity of the railways in the last few years," said Mr. Hoover, "has gone hand

in hand with steady improvement in the services rendered to the public. The chronic car shortages of former years have been overcome. The proportion of rolling stock in bad order, both cars and locomotives, has been greatly cut down. The tonnage per train has been increased. More important still from the stand point of the general public welfare, delays in the movement of traffic have been greatly reduced. The expedition of railway service has reacted favorably upon the entire economic structure. It is estimated that the rapidity of freight transportation is now from 30 to 40 per cent greater than at the close of the war."

In a supplemental report by E. Dana Durand, chief of the division of statistical research, bureau of foreign and domestic commerce, the progress in national efficiency is discussed. The report brings out the part carriers have had in increasing their own efficiency and also describes the increase that has taken place in other industries. Secretary Hoover's report is handled elsewhere in this issue.

Dismissal of proceedings brought by the Kansas City Southern R. R., attacking the Interstate Commerce Commission's valuation of that property was indicated recently by the United States Supreme Court when it stopped the argument of that case after having heard attorneys for the railroads for about an hour. The proceedings reached the court on appeal by the government from an injunction granted the road by the federal district court for Western Missouri.

The announcement from the bench which stopped the argument came after attorneys for the road had spoken against the government's contention that the case involved issues similar to those decided by the Supreme Court in the Los Angeles & Salt Lake valuation case when the commission was sustained. Attorneys for the railroad began the presentation of their case after the court had declared it did not care to hear the government's counsel.

Resignation from the Interstate Commerce Commission of Commissioner Henry C. Hall about January 1 is indicated by reports current in Washington. It has been known for some months that he intended to resign but no definite time has been fixed by him owing to his desire to finish certain work now in his hands so as not to burden other members of the commission when he does finally quit.

There have been no developments in respect to a successor for Mr. Hall although it is known that President Coolidge has a number of men in mind. The term of Commissioner Esch of Wisconsin will end December 31 but it is the general belief that he will be reappointed.

C. V. Burnside, assistant director of the I.C.C.'s bureau of finance, and Examiner O. D. Week in a proposed report just made public, have recommended that the commission deny the application of officers and directors of the Baltimore & Ohio, New York Central, and the New York Chicago & St. Louis railways for authority to serve also as directors of the Wheeling & Lake Erie Ry. in which the three trunk lines had each purchased a 17 per cent stock interest.

"Should the commission" said the proposed report, "accept the view that the acquisitions of Wheeling stock in sufficient amount to give control, and the applications for representation on the Wheeling directorate are premature, if not illegal, the trunk lines in interest should be required to retrace their steps immediately and in such manner as to secure the continued management and operation of the Wheeling as an independent carrier, without trunk line affiliations, until, in appropriate proceedings under Section 5, the issue presented may be considered in their entirety."

Gas-Electric Economy

An evidence of the economy of operation of gas electric motor cars is found in a recent compilation of data covering the 12 months of service ended August 1, 1927, by the Mobile & Ohio R. R. This road operates two gas electric cars a distance of 251 miles a day. Each car hauls a 35-ton trailer and has a gross train weight of 83 tons.

A total of 179,716 train miles was covered, using 86,339 gallons of gasoline, or 2.12 train miles to the gallon. A total of 212 gallons of oil was used, averaging 70.31 train miles to the gallon of oil. The total train mile operating cost was 35.07 cents. The detailed data is as follows:

	Cents
Repairs—labor and material	2.16
Fuel—gasoline	6.17
Lubricants	0.67
Eng. house exp. insp.	1.27
Other supplies and exp.	1.23
Wages—train & engine crews	15.22
Sub-total	26.97
Substitute train service	2.71
Int. and dep.	5.39
Total	35.07
(cents per train mile.)	
Total motor car miles	169174
Total steam train miles	10542
Total train miles	179716
Gasoline—gallons	86339
Cost—gasoline per gal.	11.01
Train miles per gal. gasoline	2.12
Car miles per gal.	4.24
Oil—gallons	212
Cost—oil per gal.	46.32
Train miles per gal., oil	70.31

More Pay, Less Work

The bureau of railway economics' statistics of Class I carriers show that in the ten-year period, 1916 to 1926, the number of employes increased 8 per cent, and the average hourly rate increased 123 per cent. The average earnings per year increased 85.6 per cent. The average hours worked per employe decreased 16.7 per cent.

Little Stories About Big Men

ONE DAY this summer, in New York, a man worth many millions of dollars was stepping from his automobile after a long trip of inspection through an industrial plant when one of his party tapped his shoulder, and whispered, "Jim, somewhere in your rounds you tore a hole in the seat of your pants."

"Thank you," said Jim. "But these aren't 'pants.' They're trousers. I don't pay $25 a pair for 'pants.'"

Laughing, the little group went into the great hotel for luncheon. "Thirty years ago this hole would have worried the heart out of me," said the man of wealth. "In those days I simply could not afford to be out of repair. And many a time, many a night I had to sew up the holes myself. I used to wonder over one peculiar thing. The work I was doing kept me on my feet all day long, but my pants kept wearing out in the seat. Never could explain it."

Doesn't the little picture accompanying this sketch carry your mind back to something that happened long ago? Happy days, weren't they? Wages weren't very high in the springtime of youth—they seldom are — and often enough you were only one jump ahead of a garnishee. In such circumstances a man just had to mend his own pants or violate the law concerning improper exposure in public.

Happy days. Chances are you'd be glad enough right now to give up your big salary and the title in such cases made and provided in exchange for an hour of the hopes and plans and ambitions and the torn pants—and the youth. The man who has lived such things, patched his pants, learned the lessons of humility, is pretty certain to be a real human being in his dealings with men not so far along as he on the highway to success.

Have you recognized him—the man in the picture? It is L. W. Baldwin, president of the Missouri Pacific Railway, one of the country's great railroad executives, and therefore one of its hard workers —L. W. B., Let Work Begin, they call him. He began at the bottom, and we are not referring to the pants—and now is at the top. We are not good at remembering texts, but somewhere in the Bible it is said that he that humbleth himself shall be exalted.

He Started At The Bottom

A Friendlier Public Now

It might have been difficult to convince Alexander Hamilton, who had no very high opinion of the common people, but things are happening every day to prove that, after all, they are far from dumb. They may be depended upon pretty generally to learn the truth if you give them time enough.

Iowa is an instance. Next to Wisconsin, perhaps, no people any where have heard more clap trap nonsense about railroads than the people of that state. When Senator Wildman Brookhart wasn't frothing around over Iowa denouncing the railroads it was done by some Communist or public ownership advocate from Milwaukee.

Very little truth ever seeped into Iowa. But, nevertheless, and be that as it may, President Howard of the Chicago Great Western Ry., went over to Blockton one day recently, accompanied by all the road's officials, and several thousand persons—all there were in the county, indeed—turned out to join in celebrating the fact that 40 years ago the C. G. W. was built into that little city. And Blockton is completely surrounded by farms whose owners and operators, if you take the politicians' word for it, are just one jump behind the railroads with a can of violent explosive. Starving farmers in automobiles and Fords were there by the thousands, and stayed all afternoon to listen to railroad speeches. And if this isn't a severe test of endurance and patriotism we agree to vote for Al Smith.

President Howard, one of the several youngest railroad presidents in the land, told the big audience that agriculture and railroads were interdependent. Neither, he said, could amount to much without the other, and the sentiment was cheered, as it should be. It rang true. Not a tie was torn up—not a railroad tie, anyway. There was the utmost friendliness. Public relations of this kind are invaluable. It would be a fine thing if all railroad presidents could or would get close to the soil and meet the sturdy people who live on it.

President Howard—he's a colonel, in case you don't know it.—

became president of the Chicago Great Western a couple of years ago when he was 41. Prior to this he had worked in various capacities with the Burlington road, and had served with distinction as commander of the "Lucky 13th" engineers, a regiment of railroad men that performed remarkable feats while overseas. Colonel Howard was born at Fairfield, Iowa. He was graduated with honors from West Point, but resigned his commission in the army and began his career as a bridge engineer. He left this job because he did not want to specialize, and started over again as a freight-handler. When America entered the World War, Howard, then 32, was a division superintendent of the Burlington.

Colonel Howard is a fine example of a big man whose entire career reads like a romance—only he doesn't look at it in this way. In less than 20 years he has risen from the bottom to the top of everything a railroad has to offer. He isn't afraid of work, real "dirty" work where one's hands grow grimy. A story is told of his getting a shovel one day and helping to move a lot of coal which a defective chute had dropped on a locomotive so that the train couldn't be moved. He was general superintendent then. Until he appeared neither conductor nor brakeman had done a thing. Shoveling coal wasn't provided for in their agreement; but they soon seized shovels when the Colonel went to work.

Colonel Howard might have had all kinds of the well known "pull" to help him along if he had been that sort of chap. But he wasn't. His father was a railroad executive. Daniel Willard, vice president of the Burlington when Howard started there, was his and his father's friend. He went to neither of them. He went into the engineering department at $90 a month, this West Pointer, and when Mr. Willard discovered him and advised him to quit and start over again as a freight handler at 20 cents an hour to learn the whole thing he had the nerve to do it. And as a result he landed where he is today.

When Colonel Howard became

President Howard of the Chicago Great Western Ry.

president of the C. G. W. letters came from all over the country. They came from bank presidents, railroad presidents — one from Daniel Willard, who had started him on the right track years before—and from other friends in all ranks and positions of life, including not a few trainmen and porters. Of them all, one that perhaps touched nearest to the heart of the thing that has made him what he is, came from a man he scarcely knew. It said:

"I soldiered under you in the 13th Engineers, and if you run the Great Western with the same efficiency and democracy that you did the old 13th, your success is assured. Best wishes from a 'buck'."

Another Jim Hill Appears

The biographies of successful men are interesting reading. What they did as they came along through life, the discouragements, the ambitions realized or set aside, the obstacles they overcame, the crises they encountered—all these things are certain to be of great help to those who may be obliged to travel much the same route.

Someone said, a few years ago, that he had never known a really big man who was not at heart a simple unaffected individual, and this is pretty nearly true. A man whose life has been given to studying these questions, to meeting these men, knows that by far the most important persons, at least in their own estimation, are the secretaries in the outside office, who have clothed themselves in what they believe to be dignity, while guarding the portals leading to the inner sanctum of the great.

If railroad presidents are very largely mysterious personages in the public mind, it is not because they attach to themselves any extremely high estimate. The popular idea, of course, is a magnificent office equipped with mahogany or rosewood furniture, oil paintings, beautiful rugs, an executive who comes down to work about 10 o'clock after a leisurely breakfast in bed and leaves at 12 for luncheon, forgetting to return before 3, and probably not then if a golf game is in the offing. The fact is, however, that railroad presidents actually are the hardest worked men on the payroll; they are always on duty, and they are in their offices, either in a building or in a business car—not a private car, please—for more hours out of 24 than any employe. Next to the president the hardest worker, perhaps, is the general manager, and in this job many a man has died broken physically and mentally.

Men ride to railroad presidencies over different routes. Ordinarily, they are referred to as operating men, engineers, lawyers, or traffic experts, and this covers the classification. It isn't important here to attempt to trace their beginnings. It probably is true, however, that the average operating president had a little bit the hardest struggle in making his way

upward. The engineer is a college man, and in most cases his years in school were fairly pleasant and filled with hope. The lawyer in most cases, also, is a college man, and came into the railroad field as an executive as a result of excessive governmental regulation of public utilities. The engineer picks up a good bit of railroad learning as he works his way along building and planning, but the lawyer seldom has had the opportunity to acquire technical knowledge covering the operation of the properties over which he presides. Few operating men ever had a chance to go to college and many did not reach high school. Some started as water boys with construction gangs. Others began their earning careers as section hands, eventually became roadmasters, and changed about from one department to another, until finally they reached the top having acquired a pretty complete knowledge of steam transportation as they went along.

A surprisingly large number of railroad presidents in American history began as telegraph operators or clerks in stations, or as station agents. The operator, in the orderly passing of time, becomes a train dispatcher, trainmaster, superintendent, general superintendent, general manager, vice president, and finally head of the works. The traffic man starts most frequently as a clerk and works his away long often through the accounting departments, some times through the various freight and passenger departments and, if nature has endowed him with the ability to make friendships as he travels, he reaches the top, able to command much business for the company employing him. Some traffic men who know just enough about the operating end of railroading to distinguish the difference between a Mikado locomotive and a switch engine, can command many train loads of traffic, and this, as the directors and the stockholders realize, is of surpassing importance.

The law is becoming increasingly attractive to young men, not because they intend to become attorneys, but because they realize,

President Hill of the N. C. & St. L. Ry.

as business men are doing more and more, the future executive will need to know a great deal more about law than the leaders in the past generation. Anyone familiar with even a small part of the regulation under which railroads are operated will be certain to sense the significance of this statement.

One of the outstanding railroad presidents of the South is James B. Hill, president of the Nashville, Chattanooga & St. Louis at Nashville. It is called the N & C down there, and the people refer to the president as Jim Hill. In him the law finds its strong and friendly advocate. Mr. Hill was chief clerk in the office of the president of the N & C about ten years ago. When leases and deeds began to surround him because of some peculiar conditions, he conceived the idea that it would be a fine thing for him to know a little law. Nobody encouraged him. Indeed, all Hill's associates frowned upon the suggestion. Particularly did these wise counsellors object to a correspondence course. But Jim Hill was not to be discouraged, and that was a fine thing eventually for the N & C. He joined or subscribed to, or entered, or whatever it is one does with a correspondence school, in Chicago, and for more than a year studied his law books diligently, but mostly during his lunch hour and at night.

"The course gave me an idea of the outstanding principles governing business as nothing else could have done," Mr. Hill said in talking about the incident. "It convinced me too, that about the best thing any young man can do is to study law whether he intends to practice for a living or go into some other industrial or commercial branch."

There isn't anything particularly dramatic or startingly original or out of the ordinary in the working career of James B. Hill. But it certainly is a fine example for a young man to follow, and examples are what we need. A man could scarcely come from a quieter, less conspicuous place than Spencer, Tenn. Spencer had no railroads when Hill was a boy and it has none now. It was at Doyle, a village about nine miles from Spencer, that young Hill found his chance in the little railroad station. There he learned telegraphy and there it was that he formed his ambition to become a railroad man. His first real job was at Sparta where he worked 15 hours a day for $15 a month. He didn't have to get up until 4:30 so he had plenty of time to read. It was in this place that perhaps the most colorful incident in Hill's career occurred when he surprised some coal thieves at work in the yard one night, captured one, and was shot by the other. Such an incident was certain to attract the attention of somebody at headquarters, and it did. Hill was soon getting $35 a month, which he says was a whale of a lot of money in those times. After a while he became a stenographer for the division superintendent, and in this important occupation

The General Was Stolen by Union Soldiers While (Buster Keaton) the Engineer, and the Rest of the Crew Were Eating Breakfast at Big Shanty.

he dragged down $45 every 30 days.

Not many telegraph operators go through just the same experiences encountered by Jim Hill. Instead of continuing in the strictly operating end of the business, he went into the accounting department and for 10 or 12 years was in the treasurer's office. After this experience he became chief clerk in the president's office and then assistant secretary, assistant to the president, and then treasurer, and finally when Whitefoord R. Cole, the president, resigned in 1926 to take the same position with the Louisville & Nashville, Mr. Hill, the $15 station agent, won his final promotion, and became president of the N & C, otherwise the N. C. & St. L.

"Railroads need, and probably always will need, more and more capital for development," Mr. Hill believes. "What this endless investment of capital means may be understood in studying railroad history. With the engine of the 60's, such as the famous old General, now standing in the union station at Chattanooga, trains of 200 tons could be handled between Nashville and Chattanooga in two days, with a night's layover between.

"Engines bought in 1870 were able to handle 16 of the little freight cars of the day, a train load of about 300 tons, and get them over the road in one long day of 16 hours. Today trains of 2,000 tons are handled in less than half that time.

"Hauling freight in the trains of 1870 cost so much that the average rate had to be three cents per ton per mile, nearly three times as much as it is today, while the wages paid by the railroad then per hour were little more than a third as much as those today.

"But one thing could have made possible these results — reducing the cost of transportation through moving heavier trains and moving them faster. To do this has required more powerful locomotives, larger cars, stronger track and bridges to carry heavier trains at higher speeds, larger yards and terminals, better shops and a thousand other things that have cost money but in the long run have saved more."

If it hadn't been for Buster Keaton's movie of Civil War days not many readers would know what President Hill meant when he referred to the General. April 12, 1862, Conductor W. A. Fuller left Atlanta in charge of a train pulled by this engine. When he reached Marietta, Ga., a party of strangers boarded the train, disguised Union soldiers under the command of James J. Andrews, of Flemingsburg, Ky.

While the passengers and crew were eating breakfast at Big Shanty these disguised soldiers stole the General and scooted up the track intending to cut the wires, burn bridges, tear up the rails, and otherwise separate the Confederate army from its base of supplies. Conductor, otherwise Captain Fuller, and some soldiers

Conductor-Captain Fuller and Associates Pursued in the Texas, and Captured the General. The Old Relics Are Owned by the N. C. & St. L.

pursued the runaway in another engine, the Texas, and captured it and its party of raiders, and the rest of the story you remember, having seen the picture.

A monument to those who fell in the "General" raid stands in the national cemetery at Chattanooga, while the old engine itself is in the Union depot at Chattanooga. The engine "Texas," used in the pursuit by Captain Fuller, stands in Grant park, Atlanta.

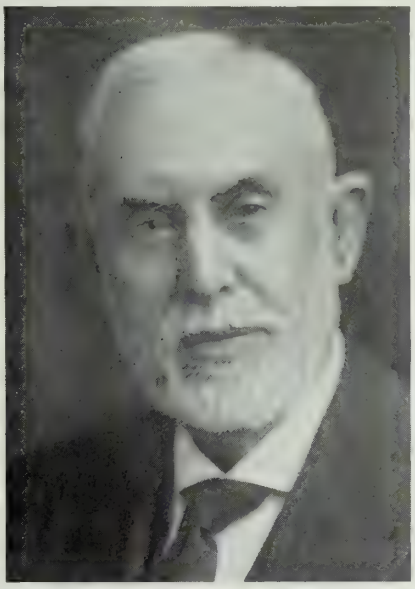
The Young At Heart Stay Young

Normal men are never old while the heart stays young. The heart resists age just as long as the man retains a lively interest in the world and its affairs, particularly the really human affairs, and more particularly the play, the rational, sportsmanlike enjoyments of life. This kind of man is pretty certain to be an optimist—the strong, kindly optimist, not the ones who slap you on the back and cry "cheer up, the worst is still to come," about the time you are sunk in despair over some tragic happening and need, most of all a little encouragement. To be really optimistic, to stay young, some men must stick to their jobs. To surrender to idleness would mean defeat.

In a few words this describes the philosophy that has run all through the busy life of W. W. Baldwin, vice president of the Burlington.

The city editor of a great daily paper once said to a young reporter, after reading a story the boy had turned in, "Son, please don't use the expression, 'the aged man.' It's the unkindest cut of all."

You can not apply this objectionable term to Mr. Baldwin although he is 84, an age at which most men are content to sit back —or at least do sit back—and watch the rest of the world rush by. Mr. Baldwin believes in work, and he believes also that every man should have a hobby. He works hard and he has a hobby, the liveliest kind of hobby: baseball. For years he's been sitting in baseball bleachers—and he vows he's going to keep on doing it until he dies. He's going to do



W. W. Baldwin, Vice President, C. B. & Q. Ry.

it because it's "good medicine," so good that he hasn't consulted a physician for years.

"Baseball means to me regular applications of fresh air and warm sunshine," he explains.

"It also has other elements that go to assure longevity. Thrills when Babe Ruth or Hack Wilson walk up to the plate. More thrills when they slam 'homers' over the left field fence.

"A man can never grow too old to get a 'kick' out of the sudden contact between an ashen stick and a horsehide sphere. Every time I leave the field after a good game I feel as chipper as a young colt. I'm proud of my hobby. I think it's going to help me live to be a hundred."

Mr. Baldwin is distinguished throughout the transportation industry as an economics expert. He's perhaps the most widely known railroad executive in the wheat and corn belts, having to do for many years with the relationships between agriculture and transportation.

He's a veteran of the Civil War, having fought as a private in many of the most important engagements. And in his lapel he proudly wears the bar of a D. S. C., the posthumous decoration won by an only son who died on Flanders Field.

The Story of Samuel Rea

Monuments have been built to honor the memory of men after they have gone. What a fine experience it must be for a man to see great public structures he has planned and built used daily by thousands — pulsing monuments testifying to the value of a life well spent!

When the University of Pennsylvania decided to honor the man responsible for the building of the New York tunnels under the Hudson and East Rivers, the Pennsylvania Station, and the New York Connecting Railroad, the head of that institution asked James McCrea, then president of the Pennsylvania Railroad, to name the man. Mr. McCrea replied:

"The Pennsylvania Railroad directors gave Sam Rea supervision of the planning and construction of the work; if it is a failure he will have to bear the brunt of the criticism, and if it is a great success, as we believe it will be, he is entitled to the credit. He has well earned any degree you can give him. It is a baby of his which he has studied for 25 years."

In 1871 James McCrea was an assistant surveyor, and was at work on the Morrison's Cove branch in Pennsylvania. On July 17 he sent a foreman to the town of Greenburg to pick up a boy to act as chain bearer and rodman. The foreman returned with a gangling youth of sixteen whom he had found leaning up against a lamp post and who answered to the name of Samuel Rea. It is not of record what conversation passed

between the two future presidents of the road, but Rea's responses must have been satisfactory for he took the job and held it until the panic of 1873 stopped all engineering work and compelled Rea to seek employment elsewhere.

"Did you know your bent was towards engineering at that time?" Rea was asked in later years.

"I was sixteen years old. My immediate bent was a job," replied Rea. The answer is significant. It lights up the man's sturdy, non-boastful, modest character like a flash of light in the dark.

A good many years later, in 1913, Mr. Rea succeeded McCrea as president of the Pennsylvania. He gave way in 1925 to General Atterbury.

"Tackle the hard jobs first," he used to say, "the easy ones have a tendency to settle themselves."

Mr. Rea, enjoying life in retirement after a marvelously constructive career, was 72 years old in September.

Howard Elliott, chairman, Northern Pacific R. R., is a plain matter of fact business man with the rare ability to go straight to the salient point, says an editorial in the Business Chronicle of the Pacific Northwest. In a recent discussion he shows how to cheapen transportation. His statement is simplicity itself: "The way to cheapen transportation is to increase the volume of business to be handled by the great mass-producer of transportation, i.e., the railroad."

His idea is merely quantity production applied to transportation. It refutes the old time idea that the way to cheapen transportation is to multiply competitive agencies. Mr. Elliott proves that the railroad has shown a constant ability to use increased volume to diminish unit costs, except where prices of labor and materials were beyond control of the railroad, and even then, he says, improved appliances and practices have prevented costs from rising to the same extent that prices of material and labor have risen.

All Mr. Elliott asks from the people of the United States is a "living wage" for the railroads.

Samuel Rea

His statement of the case is strikingly simple and convincing; and his request is certainly reasonable.

"The condition of the railroads in Mexico was a surprise to me. All of the National Railway between Laredo and the City of Mexico, 805 miles, is laid with heavy rail in excellent condition, and the larger portion of the line is ballasted with broken stone, the cross sections of which are most generous both as to the amount under and beyond the end of the ties. All of the motive power that came to my notice was in excellent condition. The locomotive engineers encountered were most skillful in the handling of the trains, and particularly in the use of air. The train crews were likewise alert and most dexterous in the performance of their particular duties.

"In Canada there are about 40,000 miles of steam railroads, with a population in the Dominion of 9,000,000. In Mexico the total steam roads approximate 10,000 miles, or one-quarter the mileage of Canada, with a population twice as dense as Canada. Mexico is a good example to show conclusively that density of population per mile of railroad does not prove, by any means, that the traffic of the railroad is heavy. Mexico is not a consuming nation. The individual needs are small; the peons' wants are few. Consequently, there is less to be transported."—President Alfred, Pere Marquette Ry.

The Executives Meet

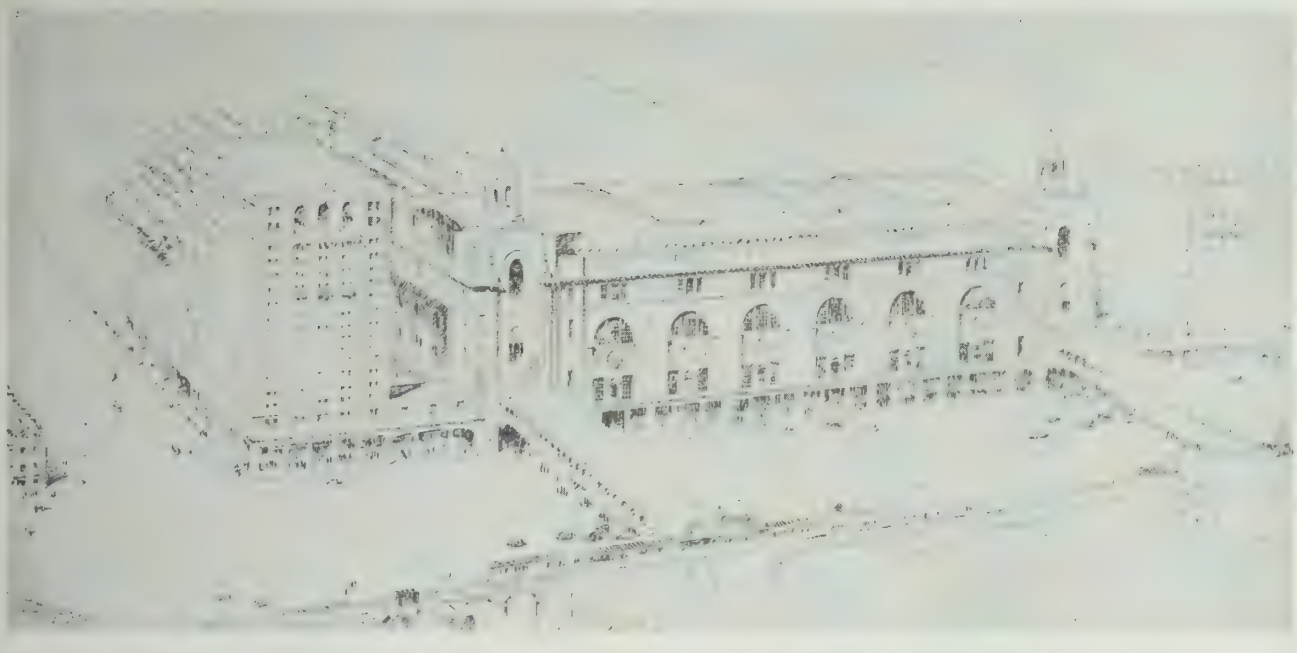
The annual fall meeting of the Association of Railway Executives was held on November 16 at New York City, with virtually every Class I railroad represented. The meeting was held to discuss various matters, principally of a routine nature, of interest to the railroads of this country. R. H. Aishton presided.

W. G. Besler, chairman, Central Railroad of New Jersey, resigned as a member of the executive committee, and R. B. White, president of that road, was appointed in his place. The other members of the executive committee were re-elected. Alfred P. Thom, general counsel of the association, and S. J. Strong, secretary and treasurer, were also re-elected.

At a meeting of the executive committee which followed the member roads meeting, R. H. Aishton, president of the American Railway Association, was re-elected chairman of that committee.

The Great Northern is planning airplane trips for tourists on its lines as soon as airports are available.

There is an automobile for each five citizens of the United States, or was when the count was made. Since then mortality among pedestrians may have changed the ratio.



The Boston & Maine's New North Station Project in Boston Will Cost $10,000,000. Work Already Has Been Started. The Architects' Sketch Shows A Grouping Suggestive of the Grand Central Terminal in New York.

New Station for the Boston & Maine

Project to Cost $10,000,000

By J. W. Watkins

A NEW North Station for the Boston & Maine R. R. on its present site, facing a widened Causeway street, and adjacent to the new million dollar Northern thoroughfare, with a vast convention coliseum and sports arena above it, a new hotel on its western wing, and a new 14-story public office building and distributing terminal flanking it to the east, are provided for in a comprehensive construction program just announced by Homer Loring, chairman of the board. The work has already begun, it is stated.

The North Station development program involves a group of related projects which, with the land and the street improvements entering into it, will aggregate about $10,000,000. The station waiting room will have two-thirds more seats than the Grand Central Terminal in New York. The coliseum will have a seating capacity of 18,500, equal to that of Madison Square Garden.

As a first appropriation, the Boston & Maine is spending $1,100,000 on the preliminary stages of construction, work on which was started two weeks ago. The first phase of the building program will embrace the station and coliseum, to cost more than $4,000,000. Construction of the hotel and of the office building and distributing terminal are announced as the second phase, to be entered upon as soon as certain details of enabling legislation are completed.

The New North Station group will form a 700-foot monumental frontage on Causeway street. This street, with a set-back to be arranged by the Boston & Maine on railroad property, will be widened to 110 feet. The western limit of the group will be the million dollar Northern thoroughfare which Mayor Nichols has just approved. The eastern limits will be the site of the old Fitchburg station on Beverly street, now being dismantled. The new group will constitute one of the greatest building projects ever entered upon in Boston or in New England. It will mark a further step along the lines of complete utilization of railroad terminal property, similar to the New York Central's big Grand Central building program in New York.

With the Boston & Maine's newly unified $5,000,000 freight terminals just beyond, the New North Station $10,000,000 development will be not only a monument to the rehabilitation of the Boston & Maine Railroad, but also a new and improved northern gateway conducive to increased growth by the communities north of Boston, and northern New England.

With the Boston & Maine's 356 new thoroughfare for highway passenger trains a day, with the traffic, the Boston Elevated Ry.'s rapid transit service from Sullivan Square and Everett. the elevated

to and from the South Station, with the rapid transit service through the Washington street tunnel, the Boylston-Park street subway line which comes out at North Station, the East Cambridge viaduct and the street railway transportation facilities, all of which are available at the North Station in a concentrated convenience unmatched by any other spot in Boston, the North Station development will equal in growth the Park Square district, with which the new thoroughfare and Charles street will connect it directly.

The present North Station will continue as the passenger train terminal for the Boston & Maine until, under the development of the new monumental structure, the old gives way and the new emerges. It is expected that it will be ready, with spacious concourse, colorful decorations, improved convenience and the most modern facilities, about July 1, next year.

The plans for the concourse and 23-track railhead, which will be separated by ornamental grill work and glass partitions, provide for an ingenious overhead ramp arrangement for baggage by means of which the present passenger hazards involved in baggage truck movements across lines of pedestrian traffic will be obviated, and baggage will be taken to and from trains without pedestrian interference at any point. The waiting room, paralleling the concourse and connected with it by broad aisles running between ticket counter, parcel room and telegraph desk, will have 500 seats which compares with 300 in the Grand Central Terminal in New York. The North Station now serves 25,000,000 persons a year.

There will be three principal entrances to the New North Station from Causeway street, one at a point leading to and from Portland street and Friend street, another at a point leading to and from Friend and Canal streets, and the third at a point leading to and from Canal street and the present subway and elevated station.

The coliseum, which will surmount the ground floor and mezzanine floor of the station proper, will be leased by the Boston & Maine R. R. to an operating group including among the Boston business men interested Charles F. Adams and H. R. ("Tacks") Hardwick, who will have as associates the Madison Square Garden interests, with "Tex" Rickard, Col. John S. Hammond and W. F. Carey.

The North Station as it will be after July first will have a great concourse 512 feet long, providing also the ideal of passenger terminal arrangements, which is available in few railroad stations in the country, with the train platform, the concourse and the waiting rooms on the same level. The trainshed will be of the umbrella type of canopy, providing complete protection for passengers, yet with provision against the fumes of locomotive gases.

The plans for the New North Station are the work of Funk & Wilcox, Boston architects, with whom are associated as consulting architects Feldheimer & Wagner of New York, who have designed some of the most important railroad stations in the United States.

The contract for the construction work for the new station project has been awarded to Dwight P. Robinson & Co., of New York.

Water Travel Exposition

At the Pacific Foreign Trade and Travel Exposition in the Civic Auditorium, San Francisco, November 11 to 20, transportation companies presented special programs and events, featuring the romance of world travel and the ease and pleasure with which it may now be obtained. Business and the educational aspects of travel were presented in appropriate exhibits. The Dollar Steamship Co., showed a revolving spherical relief model of the northern hemisphere, the work of Erwin Winterhalden, featuring effectively the world wide service maintained by the company, with views of countries and ports. The General Steamship Corpn. had a display of models of ships of the various lines in which it is interested including a magnificent model of the Ile de France, one of the largest and costliest models ever constructed.

The Union Steamship Co. displayed for the government of New Zealand the products of that island and its scenic attractions.

The North German Lloyd showed models of its steamers, a revolving globe with the routes followed by these steamers depicted, world maps and pictures of foreign travel.

The Leipzic Fair, one of the great commercial exhibitions held yearly in Europe, made a display in conjunction with the North German Lloyd exhibit. It is regarded as significant that this important fair should cross the Atlantic and the American continent to make an exhibit on the Pacific Coast.

The Matson Navigation Co., portrayed the activities developed by that company between Hawaii and the mainland.

The Hamburg-American Steamship Co. exhibited models of its de luxe liners, world travel pictures and views of foreign ports. There was also advance data on the four new ships to be put into service on the Pacific and named after the four largest cities on this coast.

W. C. Dennis an inventor of Oakland, Cal. demonstrated a new marine governor. The purpose of the governor is to prevent the racing of propellers in heavy seas by the control of a reciprocating marine engine in such a way as to prevent fuel waste. By preventing the racing of the engines when the propeller is out of the water, a decided reduction is effected in fuel, and in repair bills due to excessive shock and strain on propellers, stern frames, stern bearings, tail shafts, line shafts, coupling bolts and main engine parts.

A Business Boom Is Predicted

Railways to Face A Test

By J. H. Powers

TWO interesting things developed in the yearly meeting of the Railway Business Association, held in New York November 16: A rather urgent warning from the National Industrial Conference Board that the nation's railroads will have to hump themselves if they expect to keep up with a genuine boom in business in 1928, and the adoption of resolutions deploring "political pressure" upon members of the Interstate Commerce Commission, and, further, that the incumbents should have reason for confidence in reappointment during health and satisfactory service. Commissioners, the resolutions declared, should not be appointed as representing geographical or factional interests, but only on the basis of personal fitness. Other resolutions adopted opposed experiments by congress which might endanger the private ownership of railroads, and any legislation for government control of the coal industry.

The feature of the meeting, by long odds, was the declaration of Virgil Jordan, chief economist of the National Industrial Conference Board, that the United States may witness in 1928 a business boom that "may make 1925 and 1926 look like a depression by comparison and which is likely to strain our transportation facilities and credit resources to the limit and put the selfcontrol of business men and the powers of the Federal Reserve system to a real test to prevent serious inflation and subsequent slump."

"There has been no real boom in general business in this country since 1923," Mr. Jordan said. "The enormous flow of idle funds into the stock market and into foreign securities, and the lengths to which the banks have been driven to increase their earning assets by security loans, real estate investments and instalment financing are

Illinois Central Yards, Chicago, North from Twelfth Street; New Stevens Hotel in the Background.

sufficient indications of the fact that real business has been marking time or rather moving around in circles during the past few years."

Mr. Jordan discussed the problem of discerning in advance the requirements of railroads for probable future traffic demands. He emphasized that in planning industrial transportation and trade programs for the future, it is sound policy to count on the most intensive use of existing facilities and to avoid a capacity greatly in excess of possible demands. But it is unwise and uneconomic, he asserted, to proceed on the assumption that business is destined to go along indefinitely at the present rate.

"It is just as necessary to prepare for prosperity, as it is for hard times," he added.

W. E. Sharpe of the Grip Nut Co., chairman of the conference committee of the association, presented a report of the eight members discussing future traffic growth and facilities the railroads might be expected to provide. The report presented several questions for discussion. Among these were: Are business booms extinct? This was replied to by Mr. Jordan of the National Industrial Conference Board.

Can the Interstate Commerce Commission regulate rates and revenue in accordance with traffic forecasts and facility estimates? Frank W. Noxon, secretary of the association replied to this with a paper, "Traffic Forecasts, Facility Estimates and Rate Regulation."

Are long-range national business forecasts feasible? On this point the report said:

For transportation purposes it is indispensable to make forecasting national. Car supply, though company-owned, is in effect a national pool and nationally distributed. In its adjustment of rates to the revenue levels deemed by it necessary for adequate facilities and satisfactory service, the Interstate Commerce Commission must have the national system in mind.

It is equally essential to look ahead a substantial distance. This is especially true with respect to structures built to accommodate future expansion. But it is true also of all additions and improvements, which if planned several years in advance, can be accomplished to the best advantage in something like equal annual instalments.

Can such estimates be applied to the sum total of national activities? It has already been remarked that the railways collectively and the Interstate Commerce Commission do not publish forecasts, and there seem to have been informal efforts on their behalf which indicate the difficulty. Theoretically, on the other hand, it would appear as if the railways as a whole, and their federal regulators, would be on firmer ground than individual railways, farmers, or business concerns. Depression in one industry is offset by activity in another, the general course of business may tend upward and the railways enjoy at least the prosperity of the average. Few if any kinds of activity, therefore, offer so favorable a basis for forecasting as the railways as a whole.

There are lines of business, notably the telephone, which can and do use in their capital budgets long-range national forecasts. We suggest a study of these.

Can railways make longer programs? This question is divided into several parts:

(a) The divergence in present practice among the several roads.

(b) The tendency to alternate rolling stock with way-and-structures programs.

(c) Differences of attitude toward the stabilization of labor.

(d) The depressing influence of hand-to-mouth buying upon industry and hence upon railway prosperity.

(e) Discouragement in the railway supply industry due to suspended purchases and to railway shop manufacture.

These phases are under more or less informal discussion. We think that each of them could profitably be made the subject of conference between manufacturers and railway officials.

With respect to the Interstate Commerce Commission the resolutions said:

The Transportation Act places the duty of initiating rate adjustments for adequacy of railway revenue upon the Interstate Commerce Commission. The commission should discharge this responsibility. This involves observation of traffic trends, of facility needs, of capital requirements and supply. Some of this research the railroads alone can perform. The statutory duty of the commission implies inquiry for such reports. Some of it can be done only by the commission. The expense must be met. If funds are lacking they should be provided for in the budget. Planning and supervision of such observation is a foremost first-hand task for the commission. If its members are over-burdened with lesser tasks, relief should be sought and given.

Political Pressure. In the performance of their duties, which are quasi-judicial, Interstate Commerce Commissioners should be protected, like the courts, against political pressure. Incumbents should have reason for confidence in reappointment during health and satisfactory service. Appointees should represent no geographical or occupational interest and no faction or opinion, but should be selected for individual fitness. In considering confirmation of nominees, senators should abstain from disclosure of opinions by which they desire commissioners to be guided.

A Rule of Rate Making Indispensable. We see no present occasion for amending Section 15a of the Transportation Act, the rule of rate making, except, if the Recapture Clause, which we oppose, must remain in the law, to make five years instead of one the period for computing recapturable income. If further changes in that section are pressed to the point of serious consideration by congress the Railway Business Association will labor to preserve a provision requiring the Interstate Commerce Commission so to adjust rates that carriers may have opportunity to earn net railway operating income in such amount as in the judgment of the commission will enable the roads to meet the transportation needs of the country by adequate enlargement and progressive improvement of their facilities.

Unifications. We reiterate our opposition to compulsion in railway unifications. Corporate groupings should come if at all in the course of natural economic development.

Alba B. Johnson of Philadelphia, vice president of the Philadelphia chamber of commerce and president of the Pennsylvania state chamber of commerce, was re-elected president for the ninth consecutive time.

More than 1,500 persons attended the annual dinner of the association at the Hotel Commodore at which the principal addresses were made by F. W. Sargent, president of the Chicago & North Western Ry., and Senator Bingham of Connecticut. American railroads, he said, could not be

built in any part of the country, nor indeed could it be done in the United States under the present system of regulation. Any regulation, said he, that dips into the details of management is not encouraging to the pioneer spirit, and the present system which recaptures and sometimes discounts the fruits of efficiency by reducing rates and increasing taxes is positively discouraging to the pioneer spirit. Likewise, the present system which dictates the details of operation to an extent undreamed of when regulation began, in a large measure destroys initiative and discourages management.

"Neither will encouragement be found in a policy where the fruits of efficiency are gathered promptly by the public in the form of reduced rates and increased taxes" said Mr. Sargent. "The public, of course, should participate, but under the record to date, especially in the western territory, taken as a whole the public and the railway employes have been the sole beneficiaries. In the 15 years ending with 1926 the total earnings of railways in western territory increased 105 per cent; operating expenses increased 120 per cent; investment increased 45 per cent; taxes increased 286 per cent; net operating income increased 39 per cent.

"Now, in what I may say I have no thought of unfriendly criticism of the Interstate Commerce Commission. Indeed, I think the commission is composed of men of high character, endeavoring in good faith to discharge a public duty for the public good. I trust, therefore, I may be absolved of any thought of ill-will or personal criticism when I call your attention to a trend in the decisions indicating that we are drifting back again into a national rate-making policy that in the long view of things cannot be for the public good.

"In a recent case decided by the Interstate Commerce Commission, it concluded to reduce rates materially and as one of the grounds therefor stated: 'The financial condition of the carriers principally concerned has further improved.' It would therefore appear that in view of some members of the Interstate Commerce Commission, as soon as the financial condition of the carriers 'improves,' that fact should be cited as a basis for immediate and drastic reduction in rates."

Mr. Sargent described railroad legislation, principally since the passing of the Hepburn Act in 1906. In the next decade, he said, whether traffic increased or not, the average percentage of return earned on property investment declined. The return on property investment for the year ended June 30, 1907, was 5.89 per cent. By 1914 it had declined to 3.93 per cent, and in 1915 the mileage of railways in the hands of receivers increased more than in any previous year.

"Congress, recognizing the situation for the first time since regulation began in 1887, realized the necessity of some constructive measure," said Mr. Sargent, "and in 1920 it passed the so-called Transportation Act, which for the first time incorporated into the Interstate Commerce Act a recognition of the constitutional right of the carriers to a basis of rates that would provide a lawful return and thereby stimulate investments, looking to a rehabilitation of the property.

"The railroads accepted this act as an evidence of a change in the national policy, and in the years 1920 to 1926, increased their investment by more than four billions of dollars. The result is the most efficient service ever known, at the lowest average rates in all the world.

"That is where we are.

"Railway managements are loath to believe that the public intends to break faith and revert to the policy that prevailed before the war. There are, however, certain barometers which indicate that consciously or unconsciously, we are drifting that way.

"There seems to be in certain quarters a demand for the repeal of Section 15-a. And why? Why should anyone desire to repeal a law which directs the commission to fix just and reasonable rates which will produce 'as near as may be' a fair return upon the property of the stockholders and bond holders devoted to the service of the people in providing the nation's railroad transportation facilities? Obviously there is but one answer. And that is that some stand ready to repudiate the assurance given in 1920, and thereby encourage the commission to fix rates that will not produce a fair return upon the fair value of the property. The law has been in effect seven years. In only one year have the railways as a whole earned what the commission has defined as a fair return, and the western group of roads has never approached it.

"Nevertheless, to repeal a law which only directs the commission to do what the Constitution requires it shall do would be equal to a legislative invitation to ignore the supreme law of the land and fix rates on a basis that would not produce such fair return. To repeal Section 15-a under these circumstances would result in curtailment of all classes of expenditures and a policy of drastic retrenchment, at least until such times as the effect upon the commission should be demonstrated by the trend of its decisions."

Hughes Medal for Dr. Coolidge

The Hughes medal of the Royal Society has been awarded to Dr. W. D. Coolidge, assistant director of the research laboratory of the General Electric Co. for "distinguished work on X-rays and the development of highly efficient apparatus for their production."

The loss to the world each year by the rusting of iron and steel is said to amount to $2,500,000,000.

Among the Men Who Do the Work

HE has escorted the world's renowned personages and has seen them in their playful moods. He punched the ticket presented to him by Crown Prince Ferdinand of Austria-Hungary, a royal passenger whose assassination in Serbia, in 1914, precipitated the World War. Three times he has escorted presidents of the United States into Yellowstone National Park. The lore of America's most picturesque recreation area is his possession.

He is J. J. Clark, passenger conductor No. 1 on the Montana division of the Northern Pacific Ry. His run is from Livingston, Mont., to Gardiner.

When President Coolidge, Mrs. Coolidge, John Coolidge and party went to Yellowstone, late last summer, Conductor Clark was in charge of their special train. From Billings to Gardiner it was a train unlike any other for many months. A half hour ahead of it a pilot train operated. When Conductor Clark's train moved over that section of the Northern Pacific switches were spiked and no other train was moving. Officials of the railroad selected Mr. Clark for this important duty because of his experience.

One of the members of the presidential party noticed the numerous stars on the sleeve of his coat.

"You must have been in the service of this railway company for a great many years," he said. Clark nodded and smiled.

Clark was born July 8, 1862, at Malone, N. Y. He began railroading in 1877 and entered the service of the Northern Pacific in 1891. Since that time he has been in the continuous employ of that company and he has never missed a pay day; that is, he has been punctual in his performances.

"In 1903, when President Roosevelt came west to dedicate the Gardiner Gateway I was in charge of the train from Billings to Gardiner and return from the park, and had an opportunity to meet and talk with 'the wielder of the big stick,'" Clark said. "An amusing incident happened on this train in the presence of President Roosevelt. Several of the negro servants in the party were observing the scenery and I called their attention to Electric Peak, telling the party that it was one of the highest peaks in the park. Then turning in another direction I pointed out what is known as Niggerhead Mountain. One of the negroes seemed impressed and turned to the others, saying: 'We colored folks might not have a nation of our own or a flag of our own but out here these folks done give us a mountain.'

Conductor J. J. Clark

"In 1923 I had the pleasure of being in charge of the special train which handled President and Mrs. Harding and party from Helena to the park. Mr. Harding was in a jovial mood all the way and appeared to be enjoying the prospect of seeing America's wonderland."

In the fall of 1926 Clark had charge of the special train on the Northern Pacific bearing Queen Marie of Roumania and party from Billings to Helena.

Among the other notables borne over this line by trains in Clark's charge were Mrs. Hetty Green, New York financier; Thomas F. Ryan, New York public utilities developer; Miss Helen Gould, American philanthropist, and Mr. Stuyvesant Fish, New York banker and railroad official, and Mrs. Fish.

On A Coal Burner

If there is one man on a train to whom more credit should be given than to anyone else for getting it into its destination on time, that man is the fireman. True, fiction, song and history place the responsibility on the shoulders of the engineer, where it very justly belongs, but this is not a discussion of responsibility.

Very few persons know what the fireman's job is like. They know, in a general way, that he puts coal on the fire, and many of them think that ends the matter, whereas it only makes a good beginning. Besides shoveling huge amounts of coal, it is up to the fireman to keep the boiler full of water, and keep the steam pressure up to 200 pounds per square inch, and while he is resting, he is expected to devote just as much attention to operating signals as does the engineer, check up on the engineer's observance of these signals, and in cases where something happens to the engineer, the fireman must be prepared to handle the engine by himself and get the train in to its terminal in an emergency, and do it singlehanded!

The A. B. C. of Railroad Problems*

Things Every Employe Should Know

By Charles Dillon

THE departmental organization of railroads discourages the average man from studying anything about the company except the work or duties to which he is assigned. The man who expects to get ahead in his work will have to resist this influence and study the affairs of the railroad by which he is employed.

In a motion picture theatre one night not so long ago, a title was flashed on the screen that interested me greatly. A young man about to start for college said, "I am going to study hard, because I have noticed that the men who know the most usually run things." The I.S.C. News published by the Indiana Service Corpn., said the other day in an editorial that people die from many causes but no one ever heard of a man dying because he knew too much. It does pay to know things and it does pay to look out for your employer's business.

I think every railroad man, young or old, ought to know the outstanding facts about railroad business, and very few of them do. Every railroad man should be able to tell the truth about his company's affairs, and he should be able and willing to defend that company if it needs defending. Any man who will not defend the company for which he works should not work for it.

Between 1830 and 1850 about 9,000 miles of railroad was built in the United States. By 1870 we had 53,000 miles. Things began to slow down about this time, and in 1873 came the black days of panic. Railroads had been overbuilt. There was not enough traffic in the country to support the mileage. Now we have about 275,000 miles of main line and 150,000 miles of second track.

There are about 44,000 miles of electric railway, 26,500 miles of inland waterways, natural and artificial, and about 3,000,000 miles of ordinary road or highway. Of this about 165,000 miles is hard surfaced.

One of the Northern Pacific's Comfortable Sleepers.

There are 66,500 steam locomotives in the United States, about 57,000 passenger cars, 2,500,000 freight cars and 89,000 gas or gas electric motor railroad cars.

There are in the United States, 2,080 railroads of one kind or another, long and short, divided into three classes. Class 1 includes railroads having an operating income of more than $1,000,000 a year and in this class there are about 200 railroads. Class 1 railroads cover about 90 per cent of the total mileage, or about 250,000 miles.

About 7,000 short lines have been built in the United States since the beginning of railroading, but the largest part of these have been absorbed by the large systems, a process which began some time in the 50s. The Pennsylvania Railroad, for example, is made up of about 650 short lines, the New York Central 400, the Burlington 250, the Missouri Pacific 200 and the Santa Fe 175. Of the 700 short lines now in existence something more than 400 are members of the American Short Line Railroad Association.

There are approximately 22,000,000 automotive vehicles registered in the United States, or there were that many this morning. About 21,000,000 of these are private automobiles, and these private cars account for the largest part of the railroad's dwindling passenger business. In 1926 motor buses handled 120,000,000 passengers, and the railroads 875,000,000.

There are 115 railroad associations and clubs in this country, the principal ones being the American Railway Association, the Association of Railway Executives, and the American Short Line Railroad Association. The A.R.A. is made up of 12 associations, seven divisions and 24 sections and looks after the mechanical, operating, purchasing and accounting affairs of the railroads.

The Association of Railway Executives handles legislative, legal and financial matters, and gives its attention to creating and maintain-

* Excerpts from an address delivered the evening of November 18, to representatives of railroads entering Los Angeles, traffic officials of industrial concerns, railway supply manufacturing companies, and others, at the club rooms of the Pacific Electric Ry. Co.

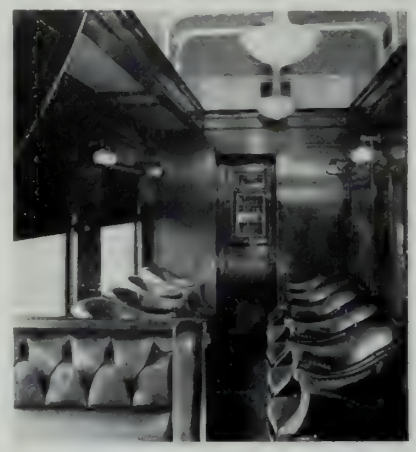
ing proper public relations. This is done largely through two committees of presidents, one having its headquarters at 143 Liberty street, New York, and the other, representing the western half of the country, in the Transportation Building, Chicago. Either of these committees will supply printed facts about the railroad business to any person making such a request.

The railways employ an average of 1,775,000 employes and pay them about $3,000,000,000 a year in wages. These forces average monthly 17,000 executives and other officials, 282,000 professionals, clerical and general employes, 457,000 men engaged in maintenance work on roadbed and structures, 490,000 in repairing locomotives and cars and 547,000 connected directly with the running of trains. More men are employed in maintaining and repairing railway property than are needed in the actual conduct of transportation business.

For one month the total salaries of the executives and officials amounted to $8,000,000. Professional, clerical and general employes were paid $39,000,000, maintenance forces on roadway and structures, $42,000,000, equipment maintenance forces $65,000,000, transportation employes $94,000,000.

But railroads create much employment for other millions through their purchases of fuel and material and supplies. These purchases in 1926 amounted to about $2,000,000,000. When rates are reduced, or legislation or other influences cause the railroads to retrench, the effect is felt almost instantly in every part of the country, because of the many industries engaged in making things out of which transportation is manufactured. Men are laid off when there are no orders, wages are cut, the men cannot buy and cannot pay their bills, and when they do not pay the storekeeper is in the same fix, so that presently we have a depression in business and sometimes a panic.

What seems to have been the last general rate advance was in August, 1920, and the last general reduction in 1922. But rates have been in the process of downward revision through thousands of adjustments almost constantly, a fact which the public and railroad employes generally seem not to know



Northern Pacific Parlor Car.

about. Freight rates now, the country over, are about 50 per cent higher than they were in 1919 and in the western district about 37 per cent higher. But despite all rate advances since 1916, the increased labor costs, the higher cost of material and supplies and taxes have prevented railroad owners from deriving a dollar's benefit.

Since 1900 railroad taxes have increased 700 per cent, from less than $50,000,000 to nearly $400,000,000. In 1926 taxes in the western district absorbed 6.7 per cent of the gross and 26.3 per cent of the net. In the northwestern region taxes took 7 per cent of the gross and 28.1 per cent of the net. In 1916 railroads paid $175,000,000 in taxes, in 1926 they paid $391,000,000. In the first nine months of 1927, Class I railroads paid taxes amounting to $288,365,000, which is a decrease of a little more than 1 per cent below the same nine months in 1926.

In 1916 total expenses and taxes were $2,557,000,000; in 1926 they were $5,169,849,000. In 1916 the railroads paid California alone in taxes a little more than $5,000,000; in 1926 they paid the state $12,500,000.

In 1916 railroads paid the United States government in taxes $12,500,000; in 1926 they paid $110,000,000.

Federal taxes are going down constantly but, due to extravagance, wastefulness and political mismanaging, state and local taxes are going up every year. New York state collects the most of any state in the Union in railroad taxes. In 1916 it took from the railroads $11,700,000, and in 1926 railroad taxes paid in that state amounted to $24,225,000.

For several years railroad taxes have exceeded the dividends paid to the owners by from $30,000,000 to $35,000,000 a year.

The railroad problem about which you have heard so much in the last few years has been created principally by restrictive legislation, federal and state. There are today more than 5,000 federal laws and about 20,000 statutes affecting railroads in one way or another.

Rate regulation rests upon 16 words in Section 8 of Article 1 of the United States Constitution. This confers upon congress the power "to regulate commerce with foreign nations and among the several states and with the Indian tribes."

Upon these 16 words has been built the entire superstructure of the most amazing system of railroad regulation known anywhere in the world. Ninety-five or more government bodies regulate railroads: congress, the Interstate Commerce Commission, 45 or 46 state boards and 48 state legislatures. Eleven floors and a basement in the gigantic Interstate Commerce Commission building in Washington are filled with men and women, divisions, sections and

boards, all regulating railroads, and several floors in another building across the street are given up to the same purpose.

In Canada all railroads except the Canadian Pacific are owned by the government. In this country all railroads are privately owned except the Alaska Railroad. Our own experience with government ownership or operation came to us during the World War when it seemed necessary for the government to take over the railroads as a war measure. At the conclusion of the war when the railroads were returned to their owners, the Transportation Act of 1920 was enacted by congress. I don't believe you need to know more than two or three of the outstanding features of this act, but you should know these. Section 15a, the rate making section, says:

> In the exercise of its power to prescribe just and reasonable rates the commission shall initiate, modify, establish or adjust such rates so that carriers as a whole (or as a whole in each of such rate groups or territories as the commission may from time to time designate) will, under honest, efficient and economical management and reasonable expenditures for the maintenance of way, structures and equipment, earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return upon the aggregate value of the railway property of such carriers held for and used in the service of transportation.

Another part of the same section gives the commission power to determine from time to time what the fair return shall be keeping in mind always the transportation needs of the country.

Leaving out details which are historical and have to do with the past, it is enough to say here that the commission decided in 1922 that until further notice 5¾ per cent would be considered by it to be a fair return. Anything in excess of 6 per cent must be divided 50-50 with the government. This is provided for in what is known as the Recapture Clause.

Notwithstanding the plain intent of congress in the Transportation Act, and notwithstanding the direction that the commission shall make rates high enough to yield a fair return, keeping in mind the transportation needs of the country, the commission has not to the present, made rates high enough so that railroads as a whole might earn the fair return. Not since 1920, except in one month, have the roads as a whole earned this fair return, and at no time in seven years have the western roads come anywhere near it. Indeed only a very few of the roads most fortunately situated, geographically, have ever earned this fair return, and numbers of our largest lines haven't paid a dividend in years.

Cliff Dwellers in New Mexico, Visited on Santa Fe-Harveycar Side Tour by Motor.

Railroad rates are supposed to be based on the valuation of the physical properties used for transportation. Stocks and bonds have nothing to do with it. This so-called valuation has been arrived at, at least to the satisfaction of the commission in Washington, under the terms of what is called the La-Follette Valuation Act which, technically, is Amendment 19 of the Act to Regulate Commerce. LaFollette and his associates had contended for many years that railroads were largely over-capitalized, full of watered stock, charging unfair rates. The late senator, La-Follette, brought about the enactment of Amendment 19 in 1912, declaring in the senate that it would cost not to exceed $2,400,000 to make the valuation. Thirteen years after the work began, this valuation has cost more than $120,000,000. Of this amount about $30,000,000 has been spent by the Interstate Commerce Commission and the remainder by the railroads. This money came from the people, however, because the government and railroads get money from no other source, either in taxes, or in charges. And the valuation work is not finished.

Of course, you have heard that the railroads have a guarantee from the government. I hope you will never hesitate to deny this story whenever you hear it. For six months after the conclusion of the war, the government did guarantee the railroads a certain return, but after the six months period, the guarantee ceased. No harmful

story about railroads has been more persistently circulated and believed all over this country than this one story about a guarantee. The surest way to deny it is by drawing attention to the fact that if the government actually did guarantee the railroads a certain return, the government owes the railroads today more than $2,000,000,000. They have fallen short that much in earning the fair return. Moreover, if a guarantee existed and the railroads attempted to collect it, the first persons to object would be the politicians in congress and out who declare it exists.

There is only one guarantee in this country, and it does not seem to apply to railroads—the Fifth Amendment of the Constitution. You never hear any gabby politician talking about this one to his constituents. It is brought up only in cases concerning the so-called public utilities such as telephone, water, or gas companies. The last 12 words in this amendment say:

> Nor shall private property be taken for public use without just compensation.

This has been decided to mean that rates too low to yield a fair return are not "just compensation," but are, instead, confiscation and therefore illegal—where any of the public utilities mentioned a moment ago are concerned. A fair return for such utilities has been held to be 7, 8, and even 9 per cent a year. I have never been able to understand just why railroads, which are private property, should not have the full protection of the amendment described. Doubless it is because, so far as I have been able to discover, they have never—as a whole—taken the issue to the Supreme Court. It may be, however, that they prefer rather to bear the ills they have than fly to others that they know not of, or words to that effect.

I am far from being a pessimist about these things, but I confess to a feeling of gloom when I read such arguments as that made by counsel for the Interstate Commerce Commission at Kansas City, not long ago. The railroads were asking for a complete review by the federal courts of the whole rate situation growing out of what is called the O'Fallon case at St. Louis. The review was denied by the court, but this was not the important thing. It was counsel's argument for the commission. In this argument counsel for the rate-making authority said that railroads are not property at all in the usual sense but are in fact an instrument of the government performing a function of government, and therefore are not entitled to the constitutional protection which safeguards private property generally.

This is depressing and discouraging, but hope revives in the reflection that the commission is not a final court. Indeed it is not a court at all, although it is the most important semi-judicial body in the nation. Its decisions may have a more lasting effect, good or bad, upon the fortunes of the people than anything likely to be said or done by anyone in the government except the President, the United States Supreme Court or congress. I have enough confidence in our Supreme Court to hope that if the railroads as a whole—not a few, remember, but the whole lot of them—ever appeal to that tribunal it will upset some of the restrictive decisions of the rate-making commission. And in saying this I must not be understood as impugning the motives or intent of any member of that body. I like to believe the commissioners act for the best as they see the light. But there are moments when I fear they are suffering from some form of astigmatism not likely to do much for the ill-fated net return of the railroads.

Some philosopher once said that in even the most tragic moments there is a chance for a laugh. If one exists in this case it must be on the commission's side of the house when they think of anyone ever getting all the railroads to agree. Still it is worth thinking about.

Picture on the Cover

The cover picture for Transportation this month is a reproduction of one of Herbert D. Stitt's originals in colors made for the Baltimore & Ohio R. R. The several paintings tell the story of the Baltimore & Ohio in pictures. In this one the stage coach is leaving the Sign of the Indian Queen, a famous tavern on the National pike at Washington, Pa.

Automatic Substations

Circular 1793 published by the Westinghouse Electric and Mfg. Co., is a discussion of the application of automatic switching to railway use. The circular is divided into six sections: first, a thorough general treatment of the problem of automatic control; second, a discussion of the selection of conversion equipment; third, a discussion of the selection of switching equipment; fourth, a presentation of the distinctive features of automatic switchgear; fifth, a description of the scheme of operation of the control equipment; and sixth, a short discussion of automatic substation buildings.

This circular may be obtained at any of the district offices of the Westinghouse company or at the advertising division at East Pittsburgh, Pa.

From the Back Seat

"Listen," remarked the exasperated driver over his shoulder. "Lindbergh got to Paris without any advice from the back seat."—Detroit News.

But there were no grade crossings.

Many speak the truth when they say they despise riches, but they mean the riches possessed by others.

Queer Things Recorded in November

ONE of the two giant airships being built for the English air ministry, the R-100, is so far advanced that it is expected it will make its first trip in April. One American started the liveliest interest by reserving space for the first trip to New York, and was followed quickly by others.

Telegrams from London, November 24, said passengers on the R-100 would be able to dance through the clouds to broadcast music as they speed by air in what practically will amount to a three-decker hotel.

The R-100 is 700 feet long, 130 feet high and will carry 100 passengers and a crew of 35, with ten tons of mail or freight. She has six Rolls-Royce engines with a total of 4200 horsepower to drive her on a cruising speed of 75 miles an hour. The cruising radius is 4500 miles and it is said she will travel to New York in 48 hours, taking passengers at $500.

The passengers will ascend by elevator to the top of a mooring mast and enter the airship. Gangways lead to various compartments and the airship has a brilliantly lighted saloon 110 feet wide.

There are three decks, one comprising a dining-room for 50 persons and a kitchen with electric stoves. On the other decks are cabins opening on promenade decks 43 by 14 feet. Thirty-two berth cabins are on the first floor and settees and sleeping accommodation for 60 are on the other.

A Runaway Flat Car

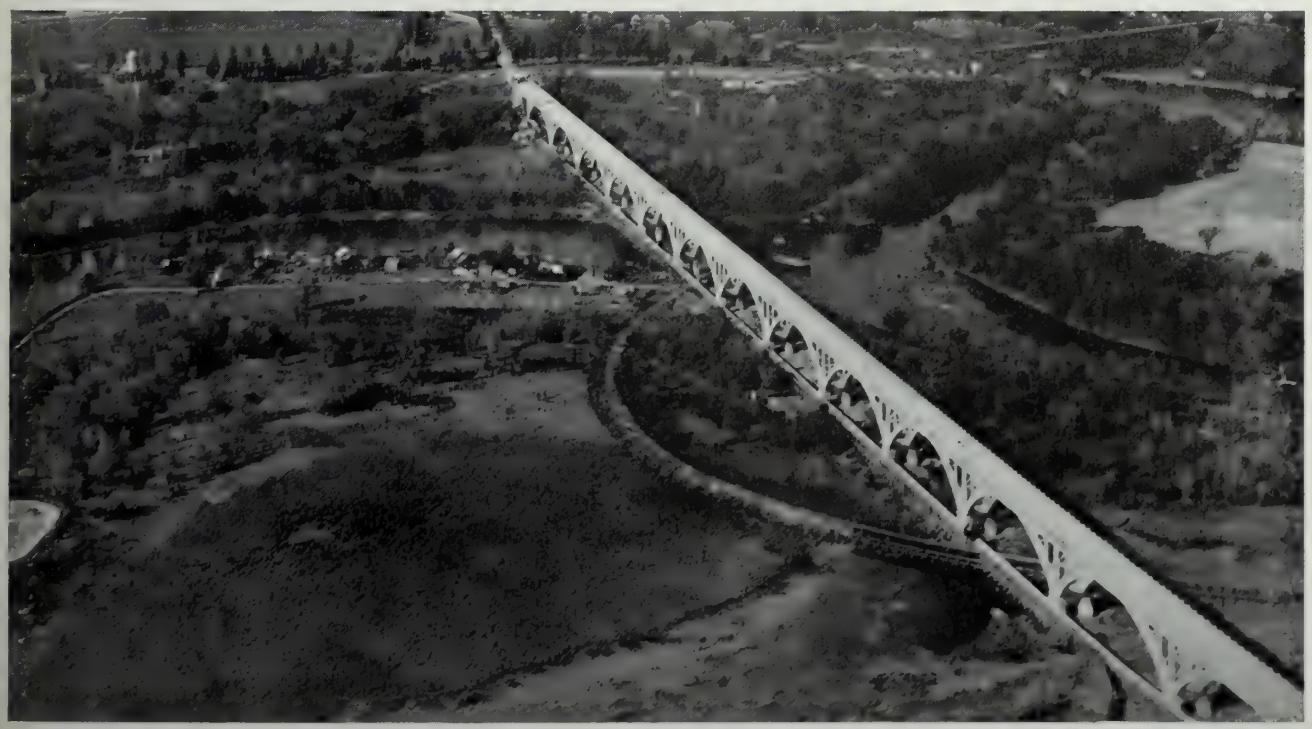
Twenty school children and two teachers were injured near Nogales, Son., November 19, when a runaway railway flat car crashed into a picnic party of more than 100 school children trapped on a railroad bridge across which they were walking.

The railway car, traveling at a high rate of speed down grade, rounded a curve and tore into the crowd of panic-stricken children. Some of them did not see the car until it was almost on them. Many leaped to the ground, 20 feet below. Several of the smaller children escaped when they lay down between the rails. They were unhurt as the car passed over them.

Gil Medina, chief of police of Nogales, said the accident was unavoidable and no arrests were made.

A Talking Autosalesman

An automobile that talks is the latest boulevard sensation in Paris. Strollers admiring a chassis in the show rooms of one of France's most popular makes were startled to hear a hollow, grating voice coming from the entrails of the



—Underwood & Underwood Photo.

This is Said to be the World's Largest Concrete Bridge. It Crosses the Minnesota River at Mendota at the Edge of the Twin Cities.

machine. "Before you, you have the famous B14 1928 model," it said and proceeded to reel off a fine line of selling talk.

The management says the phonographic salesman is bringing more business than any two living experts. It has the additional advantage of costing nothing, for the makers of the phonograph are only too glad to provide it free for the sake of the publicity.

A Modern Daily News Item

Frank Bireley, general manager of the Golden Bear Orange Products Co., Hollywood, who left yesterday piloting his own airplane, to call on customers in the northern part of the state, will fly to Palo Alto for the football game tomorrow, and is expected to return tomorrow night.

Bireley is using the ship for business calls, and says he can thus cover his territory in half the time it would take by car.

In the Midst of Life

One hundred sticks of dynamite over which three trains had thundered safely were found by a track walker November 15, planted under the third rail of the Long Island Railroad near Massapequa, Long Island.

From the position of the sticks it is evident they had been placed with the expectation that the contact shoe of the first passing train would set off the explosion. Instead the first train had brushed the dynamite aside.

He Saved the Baby

Passengers on a Reading train running 40 miles an hour between Tamaqua, Pa., and Reading November 12, felt the train jerk to a stop. They saw J. F. Slattery, the engineer, leap from his cab, slide down an embankment and lift an infant from a small creek. He carried the baby into a nearby house and completed the trip to Pottsville. The baby was Daniel Seely.

Carver Falls Near Fayetteville, N. C. Atlantic Coast Line.

As the train sped along Slattery had seen the child tumble into the water.

Listen, My Children

Another Paul Revere went for a ride, and to his sorrow. He went, not by horse, but by motor car, and was haled into court for lacking proper brakes on his vehicle. The court, at Franklin, N. H., Nov. 12, hestitating to place a blot, however small, against a famous name, reserved decision.

Under the Head of "Remarks"

Thundering south over the gleaming rails came the Southern Pacific Padre with Pierpont Bay crossing just ahead.

And the loaded gravel truck was stalled on the track.

But, did the truck driver cravenly seek safety for himself, leaving the train to crash into the obstacle?

Not he.

Heroically he leaped to the tracks, frantically he signaled.

Brakes shrieked madly, sparks flew from grinding wheels, and the iron monster halted just in time.

Then the trainmen pushed, and the driver pushed, and bystanders gathered and pushed, but the stubborn truck sat still and defied them. Another truck came along and pulled, and the wheels of the gravel-laden truck merely dug deeper into the roadbed.

Someone climbed to the driver's seat and began poking at things.

"Well, I'll be everlastingly and eternally—I certainly will," he said. At least, that was the general idea.

Then he loosened the emergency brake, stepped on the gas and the truck rolled calmly off the tracks.

Yes, Percival, the train crew told the driver what they thought about it, but you won't read it.

Not in this magazine.

For Ladies Only

"For ladies only"—so will read the sign hanging out of the de luxe lounge and smoking room to be installed in the Pennsylvania Railroad's new type parlor car, operating between New York and Philadelphia. Gossip is not barred from the smoking room.

Service can be given, and given again, and still there be plenty left.

A New Track Mower

A mower built to cut any distance from a railroad track between two and 13 feet has been brought out by the Fairmont Railway Motors, Inc., Fairmont, Minn. Simply turning hand wheels will move the power heads and cutter bars in or out. No tools are needed and there are no pitmans, extensions or equipment of any kind to change.

Another new feature is the ability to cut on the steep sides of high grades. The power heads are extended out over the shoulder of the grade and the cutter bars can incline downward from this point as much as 55 degrees.

Experienced mower operators will welcome the safe control. Each cutter bar is raised, lowered or tilted by one man who easily spins two hand-wheels. The cutter bars thus closely follow the varying shape of the grade as the mower moves along at three to four miles an hour.

The sickles are driven by a separate engine which insures plenty of power to maintain the best speed in the heaviest cutting. The mower is towed easily by a good section motor car. Use of a sickle engine results in faster progress and avoids the overloading which formerly wore out many motor cars used for towing mowers without an engine.

New Fairmont Track Mower

If the cutter bars strike a post no damage results as the mower is automatically uncoupled from the motor car, which reverses and couples up again by simply backing into the mower. Either sickle operator can step on the brake and stop the mower if the motor car driver fails to stop for obstructions.

Passing of whistle posts or semaphores is made easy by the power lift which quickly raises the cutter bars vertical and draws in the power heads if necessary. In two minutes they can be wheeled out again and cutting continued, or the machine run into clear for a train.

"Whistling Away the Friends"

I have just read with much interest in Transportation for October, the editorial entitled—"Whistling Away the Friends." I cannot help but be very deeply impressed with the earnest solicitude the writer of this article shows toward the absolute peace and quiet of passengers, regardless of how many were killed or how many were injured on account of that peace and quiet. The writer does not even suggest anything to take the place of whistling, and even if he had made some such suggestion, until that suggestion had materialized should we abandon whistling, whistling that admittedly saves a great many lives? Also the writer fails to tell us what we are to do about the laws in the different states that require us to do even more whistling than we are now doing.

I wonder, if this writer was enjoying a good sleep on some train, and his wife and children were approaching a railroad crossing unaware of the approach of the train, as is so often the case, would he send a message to the engineer to go ahead and strike his wife and children, kill them or mangle them in any manner, but under no circumstances to sound the whistle and keep them off the track as it might disturb his rest?

It is true that whistling is not the final solution of the grade crossing question, but until some other solution is reached and becomes effective, we should not disobey the laws, we should not abandon the most effective means we

An Important Advantage in the New Mower is the Ability to Cut on Steep Sides of High Grades by Extending the Power Heads.

now have of preventing these grade crossing catastrophies. Let us have the substitute first and then we will all be ready to stop whistling, but as long as whistling will save lives I cannot advocate the discontinuance of the use of the whistle.

We recently had an article in one of our St. Louis papers in which the writer urged that fire apparatus, in going to fires at night, be compelled to discontinue the clanging of bells and the sounding of the siren because they disturbed his slumbers. We have here a man willing to let anybody's house burn excepting his own, merely to save himself a little annoyance. Yes, we still have Neros willing to fiddle while Rome burns.

The writer of your article calls attention to the fact that it costs money to whistle. In other words, he does not think that human lives should weigh in the balance at all as against money expended for whistling. His figures on the cost of whistling are startling. He tells us that it cost 25 cents every time the whistle is sounded.

One of the runs on our railroad, from Decatur, Ill. to Chicago and return, finds our engineers whistling for 400 grade crossings on the round trip. Not even counting the many times that the engineer is compelled to whistle for order boards, stations, etc., according to your writer's figures the engineer wasted $100 in whistling for those crossings alone, but the engineer used only ten tons of coal on the entire round trip, and it has always been my idea, perhaps I am wrong, that the steam generated by the use of this coal is partly used to pull the train, furnish steam, heat and light. I wonder by what process of reasoning your writer can figure $100 spent for whistling at grade crossings when only ten tons of coal were used during this entire trip. As a matter of fact, fuel experts have stated that it takes 2.16 pounds of coal to sound a full nine second crossing whistle on the ordinary engine. Get twenty-five cents out of this if you can.

In closing I feel constrained to say that, if the writer of your article gave the same careful consideration to the balance of his article that he did to the "cost item," I am not surprised that he has reached some of the conclusions that he has, and that he is among those still willing to fiddle while Rome burns.

D. G. Phillips,
Superintendent Safety.
Wabash Ry.,
St. Louis.

Unusual Flexibility, Safe Control, and Ease in Getting Around Obstructions Without Delay Are Commendable Features of the New Track Mower.

Modern Machines For Repair Work

Along with the problem of providing new and modern locomotives with greater tractive effort, bigger and better freight train cars and up-to-date passenger train equipment, comes that of maintaining this equipment in such condition as will insure successful and economical operation. Therefore, modern shop facilities, including machine tools, power plants, improved methods and practices in shop operation, etc., are of prime importance. That Missouri Pacific management is aware of this fact can best be shown by a review of the shop tool programs for the last five years.

Early in 1923, a careful survey was made of the principal shops on the Missouri Pacific for the purpose of determining types, capacities and condition of machine tools in locomotive and car repair shops. For a good many years very little attention was paid by railroads to shop machinery and tools for making repairs to equipment. The Missouri Pacific was no exception to this policy of getting along with the tools at hand.

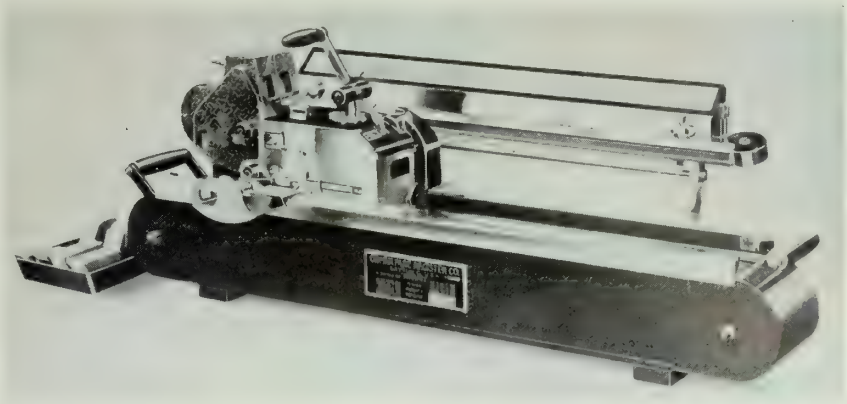
Following the survey in 1923 and beginning in that same year, an improvement program was mapped out and installation of new machine tools of latest designs began. More than $400,000 has been spent annually since that time for machine tools alone. After the purchases provided for in the budget of 1927 were made a total of more than two million dollars had been expended in that direction. In addition, special appropriations amounting to more than $1,000,000 were made to provide for new shops, power plants, repairs and improvements to existing power units and reclaim plants. This work has been carried on from year to year.

Installation of this new and improved machinery and introduction of more efficient methods and practices have resulted in increased output and maintenance of a higher standard of workmanship at a marked decrease in cost.

This Machine Prints Tickets

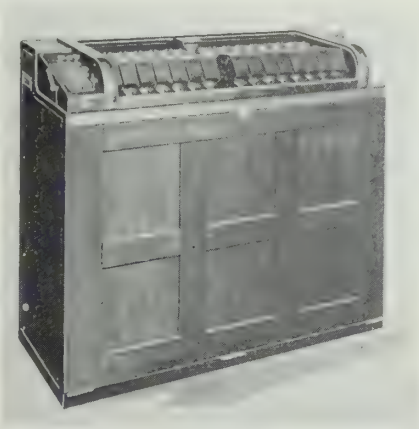
Requisitioning, printing, distributing, auditing and safeguarding railroad tickets against fraud costs very large sums of money. Changing tariffs, necessitating the destruction of old tickets and the distribution of new, adds still further to the expenditures until the financial burden and the mass of clerical detail involved have grown out of all proportion to the benefits derived. To meet this state of affairs, the Ohmer Ticket Office, Ticket Printer, Type 232, has come upon the market from the Ohmer Fare Register Co., Dayton, Ohio. This printer turns a blank cardboard slip instantly into a railroad ticket with the name of the station of departure and destination, the date, the ticket number, the amount paid, the number of miles, and any special instructions desired.

Not only are railroad tickets printed and issued accurately and quickly but a complete detailed record of all the essential information is printed automatically in duplicate on the two control tapes. One of these tapes is accessible to the ticket seller at all times and is used by him in checking and balancing his receipts. The other control tape is for the auditor and is accessible only to him or to his authorized representative. It is removed at such times as may be desired for checking and is filed as a permanent unalterable detail record of ticket sales.



Type 232-T-3 With Capacity of 100 Tickets a Minute.

In addition to the protection offered by the control tapes, the machine is provided with segregating totalizers which are accessible to the auditor only, or his representative.



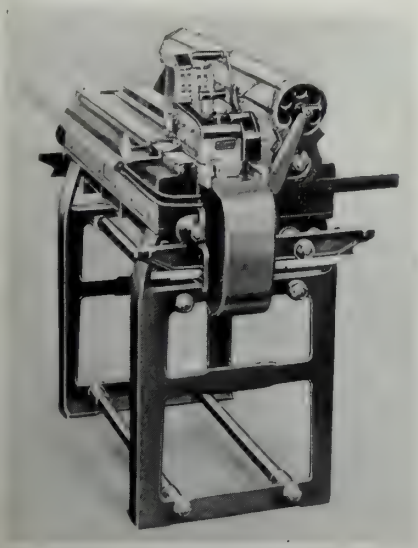
Ohmer Rapid Printer Type 233. Prints and Issues 250 Tickets a Minute.

From these totalizers may be taken at any time printed totals showing the number of tickets sold by the ticket office to any destination. From another automatic counter the total number of all tickets sold is visible at all times. The value of these totals in building up traffic statistics will be at once apparent.

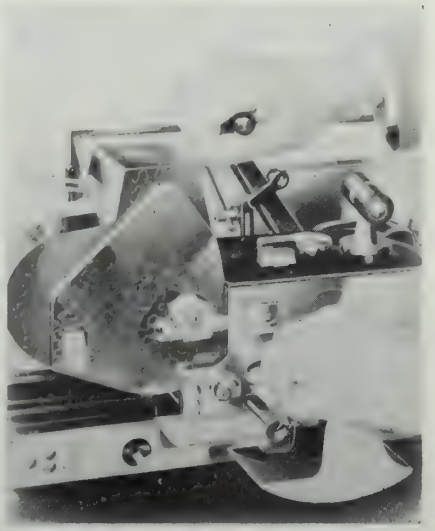
The printer has proved itself to be thoroughly successful under the most severe operating conditions. It is reliable and accurate. It affords a perfect method of checking ticket sales and so thoroughly simplifies the details of auditing that the usual intricate and costly bookkeeping methods are no longer necessary.

In case of sudden changes in tariffs the necessary adjustments are quickly made. In fact, one of the great advantages of the system is its perfect flexibility and the ease with which changing conditions can be met without delay and without the serious losses involved in the destruction of supplies of preprinted tickets and the printing and distribution of new supplies.

If you intend to go to work there is no better place than right where you are; if you do not intend to go to work you cannot get along anywhere. Squirming and crawling about from place to place can do no good.—Abraham Lincoln.



Ohmer Ticket Printer Type 232, Capacity 2500 Destinations.



Type 232 Printing a Ticket.

Chief Iron Horse Emerson

Chief Iron Horse Emerson

During the Baltimore & Ohio centenary celebration George Emerson, chief of motive power and equipment for that company, was named Chief Iron Horse by the Blackfeet Indians sent to the celebration by the Great Northern Ry., with which Mr. Emerson formerly was connected. Mr. Emerson's 11-year-old son, George H., Jr., was named Prince Weasel Tail and a small tepee was presented to him by the Indians.

Valuation Rule Again Attacked

Railroad valuation principles which the Interstate Commerce Commission is seeking to adopt for all the railroads of the country are attacked as erroneous in briefs filed in the St. Louis federal district court, where the case testing out the government's procedure is pending.

The St. Louis & O'Fallon R.R. was ordered by the commission, December 10, to pay the government $226,880 in asserted excess earnings, and the appeal of the road, a small carrier owned by the Busch interests, to the courts to void the commission's order, as the government and railroad briefs explain, is being followed by all of the major roads in the United States.

Excess earnings on the scale laid down by the commission for the O'Fallon company will be demanded from all the other prosperous railroads in the country if the government wins the suit. The total amount which the government may collect has been estimated by the commerce commission as $400,000,000, but the O'Fallon brief, prepared for railroads concerned by Cravath, Henderson & Degersdorf of New York, asks the court to view the issue as "not an academic controversy upon economic principles, but a law suit in equity."

"The Interstate Commerce Commission has made an erroneous and inadequate finding of the value of the O'Fallon property," the brief proceeds. "It has failed to give due and effective weight to the enhanced cost of construction as applied to all the property of the carrier in existence prior to 1914, but has based its findings of the value thereof on 1914 prices. . . . The commission has failed to follow the law of the land."

Railroad income recapturable by the government as excessive can be

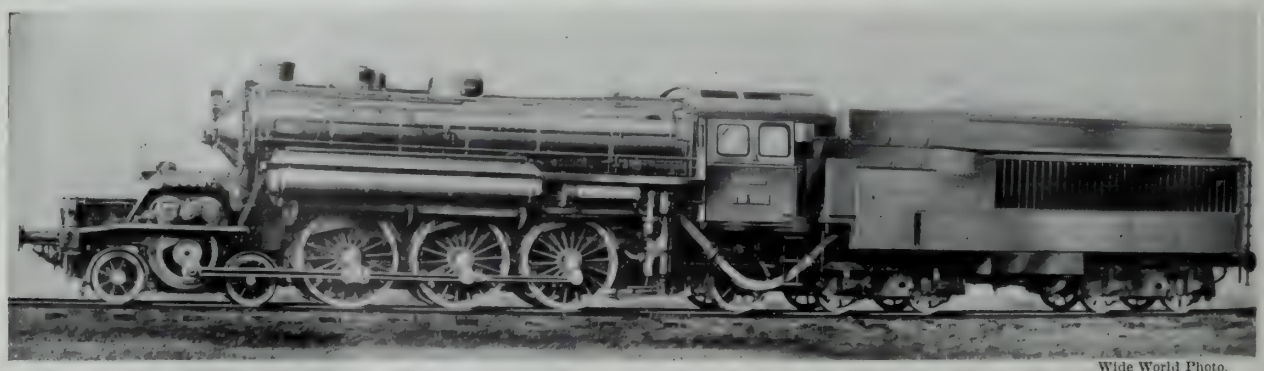
Prince Weasel Tail Emerson

determined only after the commerce commission has valued each property separately, thus laying a base upon which returns can be figured. The law provides that the railroads may retain an income amounting to 6 per cent on the valuation found, but that they must pay over to the government one-half of the excess above 6 per cent.

Walter L. Fisher, special counsel for the commission, suggests in his brief that the valuation sought by the railroads on the basis of cost of reproduction and other factors, would, if approved, result in a general rate increase of perhaps 18 per cent.

38,000,000 By 1940

There will be 38,000,000 motor cars in the United States by 1940, according to a prediction by George Brosch of the Automotive Equipment Association of Chicago.



Wide World Photo.

New Locomotive of the German State Railways Built by Maffei of Munich. It is Driven by a Turbine. The New Engine Has a Benson Boiler. It is Lighter Than the Standard Reciprocating Engine of Equivalent Horsepower. The Designers Expect a Reduction of 50 Per Cent in Fuel Consumption.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

A. CURTISS James, after making a tour of inspection of the Western Pacific lines, gave out a statement, November 16, saying the road was going to spend $20,000,000 on improvements. "We expect to make the Western Pacific as near a first-class road as possible," he said. "In addition to new tracks for the system, there will be new ballast for the road bed, elimination of many curves, purchase of new locomotives and rolling stock and additions of other equipment. At least $20,000,000 will be spent on improvements."

Increased Savings in Fuel

The effort of railway management to get greater results out of every dollar spent for operation is showing progressive results. A saving of more than 2½ million dollars was made in the seven months' consumption of locomotive fuel this year, for example, in spite of the fact that the volume of freight transported in the same period showed an increase over last year. For the first seven months of 1927, Class I steam railroads consumed 55,760,967 tons of coal, a reduction of 1,835,899 tons as compared with the corresponding period of 1926. These figures are taken from an analysis just issued by the bureau of statistics of the Interstate Commerce Commission. The commission's report does not include fuel for switching locomotives, and hence presents a picture only of the fuel consumed in line haul freight and passenger train service of the Class I carriers.

U. P. Earnings Improving

Carl Gray is quoted as saying that the Union Pacific, this year, will show the largest gross and net earnings for any year since the war, except 1926.

"We expect our October gross earnings to be about $1,700,000 to $2,000,000 above last year and net operating income also will be larger," Mr. Gray said. "We look for November and December earnings to exceed those of a year ago and continued improvement in earnings through the first half of 1928."

Cincinnati Votes To Lease Road

The Cincinnati Southern R. R., owned by the city of Cincinnati, will be leased to the Southern Railway system for a period of 99 years as a result of the overwhelming vote of Cincinnati's electorate Nov. 8.

The Cincinnati, New Orleans & Texas Pacific, the legal title designation of the Cincinnati Southern, operates from Cincinnati to Chattanooga, Tenn., and will be double tracked during the term of the coming lease.

Purchases and Stores Convention

The Purchases and Stores division of the A. R. A. will meet in Atlantic City June 13, 14 and 15. These dates correspond with the opening dates of the annual meeting of the Mechanical division.

Electric Freight Service in Ohio

Officials of the traffic department of the Union Traction Co. state that the new dispatch freight service, which was started October first by the electric railways in Ohio and Indiana, is proving to be a successful addition to the companies' activities. The service is offered by 18 electric railways operating in the two states and extends to Columbus, Cincinnati, Dayton, Lima, Toledo and Springfield, O.; South Bend, Peru, Fort Wayne, Lafayette, Terre Haute, Richmond, Greensburg and Connersville, Ind.; Louisville, Ky., and all intermediate points.

The Navy To Issue Air Charts

To assist trans-Atlantic flyers, the hydrographic office of the navy department has issued a "pilot chart of the upper air," the first of a series to be published monthly for a year.

Air conditions over what is considered the month's most feasible flying routes are shown. For December it gives distances, temperature, and wind and weather information for the route to England by way of Bermuda and the Azores.

The data come from 19 observation stations in Europe, the Canary Islands, the West Indies and the United States, supplemented by reports from recent trans-Atlantic flyers.

Jitneys Defeated in Miami

The citizens of Miami, Fla. recently voted on an ordinance which forbids the operation in the downtown section of the city of buses that carry fewer than 15 passengers. The vote was nearly four to one in favor of the ordinance. Not a single precinct showed a majority in favor of the jitney.

Nevada Road To Be Abandoned

The I. C. C. has authorized the Bullfrog Goldfield R. R. to abandon its 79-mile line extending from Goldfield southward to Beatty. The road was originally constructed to serve mining operations.

Electric Railway Meetings in January

The New York Electric Railway Association will hold its winter meeting at the Hotel Commodore, New York on January 31. The Central Electric Railway Association will meet January 26 and 27 at Cincinnati. The Midwest Electric Railway Association will meet at Hot Springs, Ark. on January 16 and 17. The Kentucky Association of Public Utilities will hold its annual meeting at the Brown Hotel in Louisville, January 18 and 19, and the Electric Railway Association of Equipment Men, Southern Properties, will meet at the Roosevelt in New Orleans on January 25, 26 and 27.

Large Orders for Rails Being Placed

During the past month, large orders for rails have been placed with the mills by the leading railroads. Included in the orders are the following: Southern Pacific, 94,867 tons; Pennsylvania, 200,000 tons; New York Central, 177,140 tons; Santa Fe, 124,700 tons; Milwaukee, 50,000 tons; Erie, 47,000 tons; Burlington, 60,300 tons; Chesapeake & Ohio, 55,000 tons; Frisco, 35,000 tons; Boston & Maine, 10,000 tons; Wabash; 20,000 tons; Union Pacific, 30,000 tons, and the Omaha lines of the Chicago & North Western. The Missouri Pacific is in the market for about 60,000 tons and the D. L. & W. for 17,000 tons.

Too Many Bridges

The National Rivers and Harbors Congress will hold its 23rd annual convention in Washington this month. Two important questions will be taken up, one the Mississippi flood problem, and the other the necessity of minimizing the number of bridges over waterways, such structures now growing so numerous as to peril water-borne commerce.

Panama Canal Traffic Increases

Panama Canal traffic established a new record for the last fiscal year with a constant procession of 6072 seagoing craft, or an average of 16.6 ships per

day passing through the great ditch. The annual report issued late in Novembe shows the total net revenue from all sources, except operations of the Panama Railroad Steamship Line, is placed at $18,131,819 as compared to $17,340,865 the preceding year, the "auxiliary business operations" of the canal administration yielding a net profit of $876,536 on shops, storehouses and fuel plants and $1,644,189 on railroad activities exclusive of the steamship line but including commissaries, docks and cattle industry.

Highway Safety Campaign

The American Road Builders Association has announced in reporting the progress being made in its national highway safety campaign that nearly 200,000 persons have pledged themselves to use courtesy and caution on the highways during the coming year. The association is offering $1,000 in prizes for the best ideas that may be used in promoting safety on the streets and highways. Included among the objectives of the movement are the education of motorists and pedestrians in the ways of safety.

California Road Control Sought

The Southern Pacific and the Santa Fe have asked permission from the I. C. C. to purchase control of the Petaluma & Santa Rosa Railroad. The Petaluma company owns 40 miles of line and operates steamboats into San Francisco. The purchasing corporation has a contract to pay $90 a share for two-thirds of the outstanding stock.

Electric Line Changes Name

The name of the Wilmington & Philadelphia Traction Co., Wilmington, Del., has been changed to the Delaware Electric Power Co. As the business is conducted largely in Delaware, with no operations in Philadelphia, and as the old name gives no indication of the company's large electric light and power department, which serves approximately 70 per cent of the population of the state, it was deemed advisable to select a new name which would more clearly indicate the character and location of the company's combined business.

Floods Will Affect B. & M. Earnings

The Boston & Maine in October earned a net income of $578,352 which compares with $501,741 in October last year. This improved showing was made notwithstanding a decline in operating revenues of $337,369. Operating expenses were reduced $355,373. Wages were $136,273 larger than they would have been without the increases by arbitration awards and otherwise since January first. The railroad has just completed a survey of its financial losses from property damage by the floods, which shows that the cost of restoring the physical properties of the railroad will approximate $2,500,000. To this must be added the loss in revenues due to diversion of traffic. The effects of these losses, with the increased costs of maintenance and operation, will be evident for some months in the statements beginning with the November report. These effects of the flood will prevent any real comparison for the full year's operations. The figures for the ten months ending October 31, before the effects of the flood were felt, show the following: Decline of gross earning of $2,679,778 and of net income of $341,281. However, the charges to operating expenses on account of improvements showed an increase of $583,389 and charges to operating expenses on account of equipment retirements increased $388,092. The increase in these items totaling $971,481 should be considered in comparing the net income.

Buses for Mobile, Ala.

Bus operation will be substituted by the Mobile Light & Railroad Co., Mobile, Ala., in the area served by the section of its Charleston-Beauregard line west of South Cedar street, if an agreement reached by officials of the company and the city commission is approved by the Alabama public service commission.

Cotton Belt Would Operate Buses

On January 16 the Texas railroad commission will hold a hearing on the application of the St. Louis Southwestern for permission to discontinue the operation of the two passenger trains operating in each direction daily between Tyler and Lufkin, a distance of 94 miles, and to substitute for them buses and trucks operating on more frequent schedules. The railroad line between these two points is paralleled by a hard surfaced highway over which an independent bus and truck line is operating under an exclusive franchise granted by the railroad commission under the terms of the Texas law applying to common carrier motor vehicles. In view of the exclusive nature of the franchise held by the present operators the Cotton Belt proposes to contract with them for bus and truck service instead of operating its own highway vehicles. Under the terms of the proposed contract four round trip bus schedules would be operated between Tyler and Lufkin daily instead of the two round trip train schedules now existing. The buses would use the facilities of the railway stations along the line, and in addition would make the stops at other points in the towns that they now make. The rate of fare to be charged on the buses would be the same as that now in effect for transportation by train and the railway tickets would be honored on the buses. The railway line would be maintained for freight service, and in emergencies which might prevent the operation of the bus line, passenger service over the railway line would be rendered. It is said that in case the replacement is approved by the commission, new bus and truck equipment will be purchased by the Cotton Belt.

C. & O. Net for October Decreases

The gross revenues, net railway operating income and net income of the Chesapeake & Ohio, including the Sewell Valley with operating ratio show gross revenues for the month were $11,722,916, a decrease of $983,447 under October of last year; operating expenses were $7,639,924, a decrease of $603,113 as compared with October of last year; net railway operating income is $3,393,432, a decrease of $441,890 under October of last year. The net income after all charges for October, 1927, was $2,725,592, a decrease of $524,102 under October of last year. The operating ratio is 65.2 per cent compared with 64.9 per cent for October of last year, or an increase of 0.3 per cent.

For the ten months ended October 31, 1927, the Chesapeake & Ohio shows gross revenues of $114,568,688, an increase of $3,693,692; operating expenses were $76,247,414, an increase of $242,360; net railway operating income was $32,344,629, an increase of $1,869,900. The net income after all charges is $25,757,690, an increase of $2,013,938 compared with corresponding period of 1926. The operating ratio for the period is 66.6 per cent, a decrease of 2.0 per cent under the same period a year ago.

Japan Orders Turbine Generator

The Tokio Electric Light Co. of Japan has ordered a 25,000 KW. turbine generator from the Westinghouse Electric & Manufacturing Co. The unit will be built at the South Philadelphia Works and installed in the new extension of the Senju power plant. The Senju power plant is a steam standby station, located outside Tokio. This unit will be of the same design as two machines installed there in 1925, and will bring the capacity of the station up to a total of 75,000 KW. The Tokio Electric Light Co. is the largest power company in Japan, and draws most of its power from hydro-electric installations. In order to make the station serviceable the year 'round, special arrangements will be made so that the generators can be used for power factor correction during

the season when there is an abundance of water power. This will be the first time that a steam standby station has been so used in Japan.

New York Club's Annual Dinner

The New York Railroad Club will hold its annual dinner at the Hotel Commodore, the evening of December 15. The principal address of the evening will be delivered by H. F. Guggenheim, president of the Guggenheim Fund for the Promotion of Aeronautics.

Atlantic City Convention in 1928

At a joint meeting of the general committee of the Mechanical division, A.R.A. and the executive committee of the Railway Supply Manufacturers' Association at New York, November 16, arrangements were made to hold the convention and exhibit in 1928 at Young's Million Dollar Pier, Atlantic City, from June 13 to 20. Arrangements for the proper housing of the convention and exhibit include the erection of a substantial building on the ocean side of the boardwalk adjoining the pier, which will be accessible both from the boardwalk and the pier. This building will provide approximately 50,000 sq. ft. of additional space.

New Car Milage Record of C. G. W.

The Chicago Great Western ended October with a new high record average of 50.2 miles per car per day. It is said this is the best record ever made by any railroad in the northwest region, and it is all the more remarkable as October is one of the busiest months in the railroad calendar.

Motor Transport Division Organized

R. H. Aishton, president of the A. R. A. on December 3, announced that due to the growth and increasing importance of the motor bus and truck as an adjunct of railroad transportation, a new division of the A. R. A. has been created known as the Motor Transport division. Membership in the division will be confined entirely to representatives of the railroads or subsidiaries in the United States, Canada, Mexico and Cuba. Headquarters of the division will be at the offices of the A. R. A. at 30 Vesey street, New York. A. P. Russell, of Boston, vice president of the New Haven, and president of the New England Transportation Co., which operates the motor buses of the New Haven system, has been appointed temporary chairman of the Motor Transport division. The temporary general committee named to organize and outline the work of the division follows: A. P. Russell, vice pres., New Haven, (temporary chairman); J. G. Drew, vice pres., Missouri Pacific; H. F. Fritch, pass. traf. mgr., Boston & Maine; A. Hatton, gen. supt. of transp., Canadian Pacific; C. S. Lake, special asst. to pres., Chesapeake & Ohio; G. W. Lupton, asst. to vice pres., Santa Fe; R. N. Van Doren, vice pres. and general counsel, Chicago & North Western; T. B. Wilson, supvr. of transp., Southern Pacific; G. C. Woodruff, assist. frt. traf. mgr., N. Y. Central. George M Campbell of New York, assistant to the secretary of the A. R. A., will be secretary of the new division. The new division has been made necessary by the increase in the number of railroads which operate motor buses, there being now approximately 60. The purpose of the organization will be to bring together the railroads interested in the development of motor transportation, whether freight or passenger, in order to study the problems arising therefrom, and, through the coordination of the rail carriers, to devise the most effective means possible for the development of such transportation. The work of the Motor Transport division will be divided into three sections, one of which will devote its attention to the study of the application of the motor bus to the use of steam railroads, while another section will study the application of the motor truck to the use of steam railroads. The third section will devote its attention to the application of the rail motor car to the use of steam railroads, particularly on lines where passenger traffic is not sufficient to warrant the operation of passenger trains. The first meeting of the division will be held in Chicago in January, the definite date to be fixed later, at which time a permanent organization will be perfected and the scope of the work of the division discussed. The division is the outgrowth of the Railroad Motor Transport Conference organized in August, 1926, by approximately 50 railroads, which were at that time either actually operating motor buses and trucks or were interested in the development of that mode of transportation. Mr. Russell was chairman of the committee on organization of the conference which was formed to provide a means for the interchange of views between all railroads interested in motor transport questions.

Rock Island Net Increases

A statement issued November 28 shows that the net railway operating income of the Rock Island lines for October, before deducting fixed charges, rentals, etc. was $2,778,908 compared with $2,719,022 for October, 1926, an increase of $59,886.

Pennsy Starts Bureau of New Ideas

To encourage new ideas and suggestions from employes for improving its service to the public and increasing the efficiency of its operations, the Pennsylvania has established a bureau of new ideas. In a circular letter announcing the new bureau, W. W. Atterbury, president, asks employes for helpful and constructive suggestions concerning not only their own departments and divisions but any phase of railroad work which they feel can be improved and made more efficient. The circular states that the management wants all employes to feel such a personal interest in the company that they always will be watching for ways and means of improving operations in all departments, on the road, in the shops, at stations, in yards, signal towers, offices and elsewhere. A mechanic in a shop or a track man may have an excellent and original idea for getting new business, or a traffic solicitor may have a workable suggestion for greater economy in the use of materials and supplies. Employes are requested to submit their suggestions in writing to the Bureau of New Ideas, Broad street station, Philadelphia, with a complete statement of what they are, how they would work and what they might accomplish. The employe's name, occupation, location and residence address is to be marked plainly on each idea submitted. The bureau will see that all suggestions are carefully considered for adoption by authorities competent to pass judgment upon them.

Report on Car Loadings to Nov. 19

Loading of revenue freight for the week ended November 19, totaled 968,-103 cars, according to reports filed November 29, by the railroads with the car service division of the A. R. A. This was 6 759 cars less than the preceding week, reductions being reported in the loading of miscellaneous freight, live stock, forest products and ore while increases were reported in the loading of grain and grain products, coal, coke, and merchandise and less than carload lot freight. This was a decrease of 103,-604 cars compared with the same week last year and 89,820 cars below the same week in 1925. Miscellaneous freight loading for the week totaled 358,477 cars, a decrease of 23,248 cars from the same week last year and 37,595 cars below the same week in 1925. Coal loading amounted to 186,330 cars, a decrease of 56,684 cars from the same week last year and 2,538 cars below the same period two years ago. Grain and grain products loading totaled 46,341 cars, an increase of 3,656 cars over the same week in 1926 but 6,871 cars be-

low the same period in 1925. In the western district alone, grain and grain products loading totaled 29,905 cars, an increase of 3,882 cars over the same week last year. Live stock loading amounted to 35,027 cars, an increase of 1,314 cars above the same week last year but 753 cars below the same week in 1925. In the western district alone, live stock loading totalled 27,165 cars, an increase of 997 cars above the same week last year. Loading of merchandise and less than carload lot freight totaled 260,319 cars, a decrease of 4,123 from last year and 8,484 below the same week two years ago. Forest products loading totaled 59,499 cars, 6,295 cars below last year and 8,778 cars under 1925. Ore loading totaled 12,813 cars, 14,799 cars below 1926, and 18 891 cars below two years ago. Coke loading amounted to 9,297 cars, a decrease of 3,425 from 1926 and 5,910 below 1925. All districts reported decreases in the total loading of all commodities compared not only with the same period in 1926 but also with the same period in 1925. Loading of revenue freight this year to date compared with the two previous years follows: 1927, 47,441,242; 1926, 48,412,144; 1925, 46,600 612.

Net Ton Miles Increase

The volume of freight traffic handled by the Class I railroads in September amounted to 42,954,142,000 net ton miles, the bureau of railway economics announces. This was a decrease of 1,391,603,000 net ton miles or 3.1 per cent under September 1926. In the eastern district there was a decrease of 6.7 per cent in September, compared with the same month last year, in the volume of freight traffic while the southern district reported a decrease of 2.2 per cent. The western district reported an increase of 1.4 per cent. For the first nine months in 1927, the volume of freight handled by the Class I railroads amounted to 357,294,784,000 net ton miles. This was an increase of 365,058,000 net ton miles or one-tenth of one per cent above the corresponding period last year and was 7.2 per cent above the corresponding total for 1925. Railroads in the eastern district for the nine months period reported practically the same volume of traffic compared with the same period in 1926 while the southern division reported a decrease of 1.9 per cent. The western district reported an increase of 1.1 per cent.

C. G. W. Has No Employe Injured

The Chicago Great Western ended October without a reportable injury to any employe. This makes a new record for the road, and probably a new record for any railroad of its size. This is especially interesting in view of the fact that October is one of the busiest months in the railroad calendar. The Oelwein shops recently closed a record of 402 consecutive days, 3,085,156 man hours, without a reportable injury, and the road states that as far as known, it is a performance never equaled in any railroad shop. The northern division already has gone 105 days without a reportable injury, while the eastern division has a record of 44 days without a reportable injury.

Pennsylvania Orders New Ferry

The Pennsylvania has placed orders for construction of a passenger and freight steamer to operate in its Chesapeake Bay ferry service between Norfolk and Cape Charles. The ferry will be the largest ever operated by the railroad company on Chesapeake Bay. Auto storage space will be provided for 46 cars on a steel fireproof deck.

Railway Construction

Tracks and Yards

FLORIDA.—The Alabama & Western Florida has applied to the I. C. C. for permission to extend its line from Chipley to Graceville, a distance of twelve and one-half miles. The road proposes to build the extension to serve a sawmill and a lime crushing plant.

IOWA.—The Burlington, Muscatine & Northwestern, which extends from Muscatine to Burlington, a distance of 54 miles, is being rehabilitated at a cost of about $600,000. The road which was closed to traffic in March is again being operated. E. L. Tobie of Muscatine is president of the road.

MICHIGAN.—The Duluth, South Shore & Atlantic has applied to the I. C. C. for authority to abandon its Republic branch, extending from Humboldt to Republic, a distance of 8.7 miles. The line was originally built to serve mines which have since been abandoned.

MISSISSIPPI.—The first passenger train to be run over the newly-constructed lines of the St. Louis-San Francisco from Aberdeen to Columbus, Miss., will begin operation on December 18. The distance from Aberdeen to Columbus is 30 miles. The line is a part of the 150 miles of new track now being constructed from Aberdeen south to Kimbrough, Ala., at which point the Frisco's new line connects with the Muscle Shoals, Birmingham & Pensacola, recently purchased by the Frisco, and now in process of rehabilitation.

NORTH CAROLINA.—The Norfolk & Western, will construct a new railroad yard containing approximately 14 miles of track, new track scales, water service facilities and yard offices, on the property acquired several months ago just north of Winston-Salem. The main line of the railway through that city will also be double tracked from Fourth street to Liberty street, and from Fourteenth street to Oakland street. The latter improvement, will involve adding about one mile of second track through the heart of the city's industrial section. It is estimated the cost of these additions will be about $800,000. The new yard will contain 13 yard tracks, each with a capacity of from 70 to 90 cars; two car repair tracks; one wye track and one running track, the total track mileage being approximately 14 miles. There will also be a 50,000-gallon water tank, standpipe and other water service facilities; a 200-ton track scale and a yard office, will be built at the south end of the yard. Flood lights similar to those recently placed in operation in the present yard at Winston-Salem will be installed.

PENNSYLVANIA.—The Bellefonte Central has applied to the I. C. C. for permission to build a 6-mile extension from State College to Fairbrook.

The Reading Co. is working on plans for the electrification of its suburban lines at Philadelphia and expects to begin work on the Chestnut Hill branch early in 1928. The electrification of lines to Glenside and the one to Langhorne will, it is stated, follow. It is estimated the cost of electrifying the Chestnut Hill branch will amount to nearly $5,000,000 which includes the expense of eliminating a number of grade crossings.

TEXAS.—The Texas-New Mexico Ry. has applied to the I. C. C. for authority to build a road 35 miles long from Monahans by way of Kermit to a point on the Texas-New Mexico state line. G. O. Bateman, Breckinridge, Texas, is behind the project.

The Northern Texas Traction Co. of Fort Worth has begun improvement work on the Arlington Heights car line between Montgomery and Sanguinet streets. The work consists in lowering the double track line to the new level of the street which will obtain when the

city's paving program is carried out, laying of new track and ties where replacements are needed, paving of street intersections and installation of modern ornamental steel poles between the tracks to carry the trolley wires. The cost is placed at $125,000.

Buildings and Structures

CANADA.—Montreal. On November 11 the Canadian National exhibited to the city authorities of Montreal the preliminary plans for a new station the company proposes to build at that point. The new structure is to front on Cathcart street, with auxiliary entrances at sides and rear. The tracks will be below the street level, and extensive room is to be provided for offices. The railroad lines leading to the station from the west will be reconstructed and important changes in location will be made, the line for much of the distance to be above the level of the street. On the line to Victoria bridge a new bridge will be constructed crossing Lachine canal. At Commissioners street, a line will branch off to the east. The tracks leading to Toronto and Ottawa are also to be changed and use will be made of the Mount Royal tunnel. The arrangement of the connection to the North Shore line is not yet settled, but the Moreau street passenger station will be discontinued. Bonaventure station will be used for a perishable freight station.

ILLINOIS. — Webster. The federal court has authorized the Milwaukee to construct a bridge over the Iroquois River, three miles north of Webster. The structure will consist of two deck girder spans each 90 ft. long and four deck girder spans each 57 ft. long. Estimated cost $42,400.

INDIANA.—Indianapolis. The Pennsylvania has ordered an electro-mechanical interlocking for S F tower at this place from the Union Switch & Signal Co.

—Syracuse. The Baltimore & Ohio has let a contract for the construction of a water treating plant at this point to J. E. Nelson & Sons of Chicago.

IOWA.—Council Bluffs. The Chicago & North Western is said to be figuring on a reinforced concrete addition, with a capacity of a million bushels, to its grain elevator at this point. Estimated cost $350,000.

NEW JERSEY.—Musconetong Tunnel. The Lehigh Valley has ordered an electric interlocking plant with 80 levers from the General Railway Signal Co.

NEW YORK.—Troy. The Boston & Maine has awarded a contract to the Roberts & Schaefer Co., Chicago, for Simplex automatic electric locomotive coaling plant equipment for installation at this point.

OHIO. — Cincinnati. Representatives of the seven railroads entering Cincinnati signed an agreement Nov. 5 for the construction of a new union terminal to cost $75,000,000. Henry M. Waite, former city engineer of Cincinnati, has been engaged as chief engineer of the project and C. A. Wilson as consulting engineer.

—Defiance. The Baltimore & Ohio has let a contract for a water treating plant at this point to J. E. Nelson & Sons of Chicago.

OKLAHOMA.—Oklahoma City. The Santa Fe reached an agreement with the city authorities Nov. 18 for the construction of a new passenger station and the elevation of its tracks in Oklahoma City.

PENNSYLVANIA.—Yoder. The Baltimore & Ohio has let a contract to the Pittsburgh-Des Moines Steel Co., Pittsburgh, for a water supply system at Yoder.

SOUTH DAKOTA.—Bonilla. The Milwaukee will construct a 100-ton coaling station at this point costing about $16,000.

WISCONSIN. — Lone Rock. The federal court has authorized the Milwaukee to construct a bridge over the Wisconsin River two miles west of Lone Rock. The structure will consist of six through girder spans each 103 ft. long. Estimated cost $100,360.

Locomotive Orders

During the first nine months of this year the capital expenditures of the Class I railroads for new locomotives was $53,721,000 as compared with $72,324,000 during the same months of 1926. However, reports we are now receiving indicate considerable improvement in the locomotive market during next year.

The October shipments of railroad locomotives, from the principal manufacturers based on reports to the department of commerce totaled 110 locomotives, as compared with 127 in September and 151 in October, 1926. Of the 110 referred to 91 were steam and 19 electric.

A. Curtiss James gave out a statement on November 16, regarding improvements to be made on the Western Pacific involving an expenditure of $20,000,000, and stated that included in these improvements was the purchase of new locomotives. The Southern is said to have inquiries out for 38 large engines and the Boston & Maine has renewed its inquiry for from 25 to 30 engines which was withdrawn a short time ago. In addition to this a number of roads are figuring on small locomotive purchases including the Newburgh & South Shore, the Algoma Central & Hudson Bay, the Toronto, Hamilton & Buffalo, and the Mexican Railway Co.

In our last issue we reported the Canadian National as being in the market for ten eight-wheel switchers for use on the Grand Trunk Western, and the Detroit & Toledo Shore Line as asking for prices on four Mikados. Both of these orders have been placed with the Baldwin Locomotive Works which have also received an order for two Pacific type engines from the Gulf Mobile & Northern. The Aluminum Company of America has ordered one Mikado from the American Locomotive Co. for use on the St. Louis & Ohio River R. R. The Chesapeake & Ohio has let a contract to the Newport News Shipbuilding & Dry Dock Co. for the repair of 12 Mallet locomotives. According to President Harahan the work is to cost approximately $300,000. According to our figures that is approximately $25,000 per engine. The work is to be done at the shipbuilding company's shops at Newport News.

Locomotives in need of repair on the Class I railroads on November 1 totaled 8,778 or 14.4 per cent of the number on line. This was an increase of 19 locomotives compared with the number in need of such repair on October 15. Locomotives in need of classified repairs, November 1 numbered 4,644 or 7.6 per cent, a decrease of 96 compared with October 15 while 4,134 or 6.8 per cent were in need of running repairs, an increase of 115 compared with October 15. On November 1 there were 5,520 serviceable locomotives in storage compared with 5,401 on October 15.

Passenger Car Orders

The outstanding development of the month in passenger car business was the inquiry of the Santa Fe for 76 cars for passenger train service. The inquiry was for 18 coaches, 20 chair, 10 baggage, 10 baggage and mail, 10 three-compartment coach and smoking, 3 mail, 3 parlor, 1 combination coach, smoker and baggage and 1 business car. Other inquiries in the market are for 16 passenger cars for the L. & N., 15 interurban cars for the Pittsburgh Railways, 10 baggage and 2 combination baggage and mail for the Long Island. It is also figured that the Seattle Municipal Ry. will purchase the 80 cars the company figured on buying some time ago but which was prevented by litigation. At the time bids were taken on these the St. Louis Car Co. submitted the best price. There are also rumors out that the Texas & Pacific will buy some new passenger equipment.

The Wabash has announced that it is placing in service the 44 new cars recently built for that road by the Pullman Co., the American Car & Fdry. Co. and the St. Louis Car Co. The dining and lounge cars are equipped with roller bearings.

The Maine Central has ordered 2 combination baggage and mail cars from Osgood Bradley, the Hudson & Manhattan, 20 steel subway cars and the Milwaukee 10 steel baggage car bodies from the American Car & Fdry. The New York Rapid Transit Co. has ordered 50 triplex units from the Pressed Steel Car Co. These triplex units consist of four trucks to each 3 car bodies which makes the order 150 car bodies and 200 trucks. The Burlington has ordered 25 and the North Western 5 gas-electric cars from the Pullman company.

Freight Cars

After a dreadfully slow market for some months with only a few scattered orders being placed, the freight car market seems to be opening up. It is not strong enough yet to get excited about, and not much to write home about but at least anything is better than what the industry has had for the last few months. It is hard to figure out just what the situation is as some of the inquiries may be only price feelers, but it is safe to say that there are good inquiries out for at least 10,000 cars.

President Storey has announced that the Santa Fe will buy 3,850 cars. The inquiry for these cars is divided as follows: 1,000 box, 500 gondola, 500 refrigerator, 500 automobile, 300 flat, 500 single deck stock, 250 double deck stock, 100 Rodger ballast, 100 caboose and 100 air pump. The Louisville & Nashville has issued inquiries for 2,150 freight cars and 100 ballast cars. The Chicago & Eastern Illinois is inquiring for prices on 500 automobile cars, and the Baltimore & Ohio, reports say, will buy 2,000 steel car bodies, and is considering the purchase of 2,000 70-ton steel hoppers. Other pending orders are reported to be, 20 6,500-gallon tanks cars for the National Railways of Mexico, 4 heater cars for the Great Northern, 700 flat, gondola and box cars for the Argentine State Ry., and some 1,000 cars on the recent inquiries of the North Western that had not been placed up to the time this was written. In addition to these cars, there are rumors floating around in the trade to the effect that the North Western will also buy 2,000 automobile cars, that H. C. Frick Coke Co. is inquiring for prices on repairing 640 coke cars, and the Woodward Iron Co. will buy 10 ore cars.

The largest orders closed recently have been those of the North Western. It has ordered 250 hopper car bodies and 250 gondolas from the Standard Steel Car Co., 250 hopper car bodies from the Illinois Car & Equipment Co. and 100 gondolas from another builder. The Chicago, South Shore & South Bend has ordered 4 cabooses from American Car & Fdry. Co. and the Fruit Growers Express has ordered 240 underframes for refrigerator cars from the Pressed Steel Car Co. The American Agricultural Chemical Co. has ordered 3 tanks from General-American, and the Koppel Industrial Company has received an order for 114 40-ton cars for export to China.

According to reports issue by the Class I railroads on November 21, they have placed in service 66,364 freight cars during the first ten months of this year. This was a decrease of 27,515 compared with the same period in 1926. On November 1, these same roads had 11,136 cars on order compared with 14,646 on the same date in 1926.

Freight cars in need of repair on November 1, totaled 139,441 or 6.1 per cent of the number on line. This was an increase of 3,796 over the number in need of repair on October 15; 100,736 cars were in need of heavy repair on November 1.

October shipments of electric industrial trucks and tractors, as reported to the department of commerce by the nine leading manufacturers in the industry, were 109 as compared with 79 in September and 132 in October, 1926.

Changes in Personnel

Executive and Operating

L. R. Powell, Jr., vice president and controller of Seaboard Air Line has been elected president of the road to succeed the late **S. Davies Warfield. Robert L. Nutt,** vice president and treasurer has been elected chairman of the board, a post also held by Mr. Warfield. Mr. Powell is a Virginian and becomes one of the youngest railroad presidents in the country. Entering the employ of Seaboard in 1902 as a clerk in the office of the auditor of passenger accounts he worked his way through the comptroller's office and in 1918 became associated with Warfield in the management of the road's corporate affairs. In the last few years he had been associated closely with Warfield in expansion and development of the railway system and its territory.

C. K. Reynolds has been elected a member of the board of directors of the Wheeling & Lake Erie railroad to succeed George Fillius.

W. G. Bruin, secretary of the Western Pacific, with headquarters at San Francisco, has in addition been elected secretary of the Sacramento Northern.

S. P. Ruddiman, chief engineer of the Detroit, Toledo & Ironton has been elected vice president and general manager, succeeding **F. L. Rockelman,** who recently accepted a position with the Ford Motor Co.

James B. O'Rear, recently engaged in colonization and development work in the southern states, has been appointed general manager of the Frankfort & Cincinnati, at Frankfort, Ky.

Charles E. Denny, vice president and general manager in charge of operation, maintenance and traffic of the Nickel Plate, with headquarters at Cleveland, has been elected vice president in charge of operation of the Erie, with headquarters at New York, succeeding **William A. Baldwin,** who has asked for a year's leave of absence.

Herman J. Klein, general manager of the western district of the Erie, with headquarters at Youngstown, Ohio, has been elected vice president in charge of operation and maintenance of the Nickel Plate, with headquarters at Cleveland, **J. W. Graham,** general traffic manager of the Nickel Plate, has been elected vice president in charge of traffic. **A. R. Ayers,** assistant general manager has been appointed general manager. **George S. Ross,** in addition to continuing as secretary has also been appointed assistant vice president of the traffic department.

Since March 1, 1920, Mr. Denney has served the Nickel Plate road as vice president and general manager. Beginning in 1916, when J. J. Bernet was named president of the road, he was, consecutively, special engineer to the president, assistant to the president, and assistant federal manager during the federal control period. With the Nickel Plate consolidation in 1923, the Lake Erie & Western district was placed under his operating juridiction, along with the Nickel Plate district, and, on

C. E. Denny

January 1, of this year, when W. L. Ross succeeded Mr. Bernet as president, Denney's jurisdiction was extended over the entire system. He began his railroad career in 1905, as assistant signal engineer of the Lake Erie & Michigan Southern, at the age of 26, after having been employed by the Union Switch & Signal Co. Promotion to chief signal engineer followed that same year. He continued in that capacity until 1913, when Mr. Bernet, then vice president of the New York Central Lines west of Buffalo, appointed him special engineer.

The Texas & Pacific having acquired the Pecos Valley Southern, **William H. Williams,** chairman of the board of directors; **J. L. Lancaster**, president; **Carl A. deGersdroff,** general counsel; **T. D. Gresham,** general attorney; **A. L. Ewing,** assistant treasurer have been elected to similar positions on the Pecos Valley Southern. **J. E. Davey,** vice president and assistant secretary and assistant treasurer of the International-Great Northern and San Antonio, Uvalde & Gulf, with headquarters at New York, has in addition been elected vice president of the Pecos Valley Southern. **M. D. Cloyd,** assistant secretary and assistant to the president of the T. & P., has been in addition elected secretary of the P. V. S. **T. H. Beauchamp** has been elected treasurer, **C. W. Veitch,** secretary and treasurer of the T. & P. has also been appointed assistant secretary and assistant treasurer of the P. V. S. **A. J. Baird,** auditor of the T. & P. has been appointed assistant auditor of the P. V. S.

George LeBoutillier, vice president of the Long Island Railroad, has been appointed to the newly created position of resident vice president of the Pennsylvania R. R. in New York, in order that the road may be more adequately represented in the largest city of the country by an officer of executive rank. The road, by reason of its extensive and growing traffic into and through New York, is becoming more and more closely identified with the affairs of the metropolis, particularly in reference to commercial and transit questions. Mr. LeBoutillier in his new capacity will be in a position to deal with these questions authoritatively as the Pennsylvania's senior representative in New York City.

Mr. LeBoutillier will also continue to serve as vice president of the Long Island R. R. He will, however, be largely relieved of operating details by reason of the recent appointment of **R. K. Rochester** to the position of general manager of the Long Island. Heretofore Mr. Rochester was assistant general manager of the Pennsylvania stationed in New York City.

W. U. Moyer

William U. Moyer, assistant to the president, and now stationed in Philadelphia, has been transferred to New York City. Mr. LeBoutillier has been in the service of the Pennsylvania system companies for 32 years. He was born in 1876 in Cincinnati, and studied civil engineering at the University of Cincinnati. He was, successively, rodman, assistant engineer, engineer maintenance of way, and division engineer on the Pennsylvania lines west of Pittsburgh, being promoted to superintendent in 1914, and serving in that capacity on four divisions. In 1920 he was appointed general superintendent, Eastern Pennsylvania division, with headquarters at Harrisburg, and in 1923 was transferred to the Long Island Railroad as vice president. Mr. Moyer, who was born in Philadelphia in 1881, entered the company's service in 1897 as clerk in the office of auditor of passenger receipts. In 1900 he was transferred to the office of fourth vice president, and in 1905 was transferred to the secretary's office in New York City. He returned to the office of the third vice president, and was successively chief clerk to second vice president, first vice president, and president and has been assistant to the president since 1918.

Colonel S. H. Church, assistant secretary of the Pennsylvania R. R., with office at Pittsburgh, has been elected vice president of the Pennsylvania and of the Pittsburgh, Cincinnati, Chicago & St. Louis. Colonel Church will continue to act as secretary of the Pennsylvania and of the Pittsburgh, Cincinnati, Chicago & St. Louis, which positions he has held since 1915. Colonel Church began his service with the Pennsylvania in 1875 as office messenger in the legal department of that part of the system west of Pittsburgh. He became chief clerk in the general manager's office at Columbus, Ohio, in 1880, and in January, 1884, was appointed superintendent of transportation at that point. He was promoted to the position of assistant secretary of the company's western lines in 1898, and was elected secretary of those lines in 1915. He also was made assistant secretary of the Pennsylvania in 1920. Colonel Church is president of the board of trustees of the Carnegie Institute at Pittsburgh.

O. F. Caeser, general manager of the Northland Transportation Co., a subsidiary of the Great Northern Ry. has resigned to become general manager of the Motor Transit Co. of Chicago.

Col. S. H. Church

C. E. Johnston, vice president and general manager of the Kansas City Southern Ry., was elected Dec. 7, to the presidency of the road to succeed **J. A. Edson**, resigned.

J. N. Shannahan, has been elected president of the Omaha & Council Bluffs Street Ry. succeeding **Fred Hamilton** who has retired as president but remains as chairman of the board. Mr. Shannahan formerly was president of the Newport News & Hampton Ry., Gas & Electric Co. He started his business career as a fireman on the Delaware & Hudson, later working for the New York Central and J. G. White & Co.

Ashley Edwards has been appointed special publicity agent, and editor, Canadian bureau of information, department of colonization and development of the Canadian Pacific, with headquarters at Montreal, succeeding **Norman S. Rankin**, who died recently.

Dr. A. R. Metz, has been appointed chief surgeon of the lines of the Milwaukee east of the Missouri River, with headquarters at Chicago, succeeding **Dr. B. F. Lounsbury**, deceased.

G. W. Kellogg has been appointed superintendent of the Ogden Union Railway & Depot Co. He succeeds **H. L. Bell**, deceased.

William Stokes has been appointed head of the Indiana Public Utility Association and the Indiana Committee on Public Utility Information. The office of these bodies is at 1547 Consolidated building, Indianapolis.

G. H. Warfel, heretofore acting assistant to general manager, Union Pacific, is appointed assistant to general manager, with supervision over all safety work and matters pertaining thereto.

E. C. Schmidt has been appointed manager of the news bureau of the Union Pacific.

Financial and Legal

Epler C. Mills, general attorney of the Chicago, Springfield & St. Louis at Springfield, Ill., has been appointed general attorney of the Jacksonville & Havana with headquarters at Virginia, Ill. **A. G. Stevens** has been appointed general attorney of the C. S. & St. L., succeeding Mr. Mills. **E. E. Breese**, controller of the C., S. & St. L., with headquarters at New York has in addition to this position been appointed controller of the J. & H.

C. W. Crow has been appointed auditor of the St. Louis & Hannibal, at Hannibal, Mo., succeeding **A. P. Wilkinson**, who has resigned.

Edward S. Carr, assistant land and tax agent of the Erie, at Cleveland, has been appointed assistant secretary, with headquarters at New York.

G. L. Dover has been appointed assistant treasurer of the Delaware & Hudson, succeeding **C. H. Booth**, deceased.

A. L. Parmalee, statistician of the Grand Rapids division of the Pennsylvania has been appointed supervisor divisional expenditures, western region, vice **S. Grossman**, resigned.

Ira H. Rowell has been appointed an examiner of the California railroad commission to succeed Reginald L. Vaughan, who has been appointed assistant attorney of the commission. Mr. Rowell has been practicing law in San Francisco since 1923.

Robert H. Newcomb, assistant to the vice president of the New Haven has resigned to engage in the private practice of law in Boston.

Fred Clark, assistant auditor of the Burlington, will retire Jan. 1, after a continuous service of 60 years. Mr. Clark was born in 1851, and entered the company's service as a telegraph messenger in 1867.

Purchases and Stores

G. K. Pitchford, storekeeper of the Chesapeake & Ohio, at Newport News, Va., has been transferred to Handley W. Va. **S. Okrent**, storekeeper at Handley, W. Va., has been transferred to Newport News.

W. N. Strong has been appointed storekeeper of the Chesapeake & Ohio at Cane Fork, W. Va., vice **J. R. Grey**, deceased.

S. R. Manion has been appointed storekeeper of the Northern division of the Pennsylvania, vice **Fred Rees** transferred to other duties.

Traffic

M. M. Allen, vice president and passenger traffic manager of the Rock Island Lines, was elected president of the American Association of Passenger Traffic Officers, and **J. D. Rahner**, passenger traffic manager of the Florida East Coast was elected vice president at the recent meeting of the association in Havana.

Clarence C. Howard, vice president of the American Exchange Irving Trust Co. has been appointed passenger traffic manager of the Erie, with headquarters at New York, succeeding **Ralph H. Wallace** who retired on December 1, after 53 years' service.

R. L. Burnap, freight traffic manager of the Grand Trunk Western at Chicago, has been appointed general freight traffic manager of the Canadian National and the Grand Trunk System, with jurisdiction over the freight traffic in the United States of these companies. He will be situated at Montreal.

The Chicago Great Western made the following appointments on November 15: **T. C. Thomas** general agent at Winnipeg, **J. A. Walden**, assistant general agent at San Francisco. **C. A. Fullen**, assistant general agent at Portland, Ore.

B. H. Coyle, division freight agent of the Wabash at St. Louis, has been promoted to assistant general freight agent.

E. L. Speer, division freight and passenger agent of the Burlington at Hannibal, Mo., has been promoted to assistant general freight agent, with headquarters at St. Joseph, Mo.

George A. Siebold, of the Great Northern staff at Seattle has been promoted to traveling freight and passenger agent at Vancouver, Wash.

R. P. Sohan has been appointed general freight and passenger agent of the Frankfort & Cincinnati, at Frankfort, Ky.

F. H. Ball has been appointed assistant general freight and passenger agent of the Fernwood, Columbia & Gulf at Tylertown, Miss.

J. H. Howard, assistant controller of the Milwaukee, has been appointed assistant chief traffic officer.

R. F. Hodgins, commercial agent of the Kansas City, Mexico & Orient at Los Angeles, has been appointed executive general agent, with headquarters at that point, and **W. J. Hilton**, live stock agent at San Angelo, Texas, has been promoted to general live stock agent, with the same headquarters.

Henry W. Stigler has been appointed general agent of the Louisiana & Arkansas at Memphis, Tenn.

J. K. James, commercial agent of the St. Louis Southwestern at St. Louis, has been appointed general freight agent.

E. E. Mack has been appointed general agent of the Midland Valley and the Kansas, Oklahoma & Gulf at Ft. Smith, Ark.

Dillard W. Layne has been appointed general agent of the Pacific Electric Ry., with headquarters at Long Beach, Calif.

Gerrit Fort, vice president of the Boston & Maine in charge of traffic, has been elected president of the Raymond & Whitcomb Co., travel agency.

Mechanical

C. James, mechanical superintendent of the eastern district of the Erie, with headquarters at Hornell, has been appointed superintendent of motive power at New York, succeeding **W. S. Jackson**, who has resigned. **F. H. Murray**, master mechanic of the western district, with headquarters at Cleveland, has been appointed mechanical superintendent at Hornell. **Albert Sutherby**, master mechanic at Youngstown succeeds Mr. Murray at Cleveland. **George T.**

Depue has been appointed master mechanic at Weehawken, N. J.

A. P. Prendergast, mechanical superintendent of the Texas & Pacific has had his jurisdiction extended to include the mechanical forces and equipment of the Cisco & Northwestern, the Abilene & Southern, the Pecos Valley Southern, the Weatherfield, Mineral Wells & Northwestern and the New Orleans terminal properties of the Texas & Pacific and the Missouri Pacific.

A. T. Miller has been appointed assistant to superintendent of motive power of the Atlanta & West Point, the Western Railway of Alabama and the Georgia R. R., with headquarters at Atlanta.

Grover C. Carver, road foreman of engines of the Boston & Maine, at Boston, has been appointed supervisor of rail motor cars, with general supervision over rail motor car maintenance and operation. **M. E. Foster** has been appointed inspector of rail motor car maintenance. The position of supervisor of rail motor car maintenance has been abolished, and **Albert A. Gagnon** has been appointed road foreman of engines at Boston, succeeding Mr. Carver.

H. P. Bender has been appointed electrical engineer of the Pittsburgh & Lake Erie and the Lake Erie & Eastern, with headquarters at Pittsburgh, succeeding **C. H. McConnell,** who has been promoted.

Norbert J. Freiert, passenger car foreman of the Erie, at Buffalo, N. Y., has been appointed shop superintendent at North Hawthorne, N. J., succeeding **John T. Munroe,** retired.

George T. Beck has been appointed chief smoke inspector of the Burlington's lines east, with headquarters at office of the superintendent of motive power at Chicago.

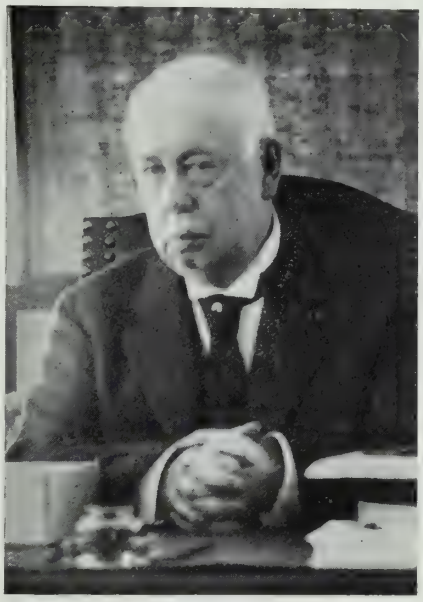
D. C. Cossar, locomotive foreman of the Canadian Pacific at Medicine Hat, Alta., has been promoted to division master mechanic of the Brandon division, with headquarters at Brandon, Man., succeeding **George Moth,** who has been transferred to the Portage division, with headquarters at Winnipeg, Man., to replace **A. M. West,** who has retired.

Civil

Effective November 15, the following changes in the engineering staff of the Atlantic region of the Canadian National were made: **F. O. Condon,** engineer maintenance of way was appointed principal assistant engineer, headquarters Moncton, N. B. **T. L. Landers,** division engineer, Edmundston, was appointed engineer maintenance of way headquarters, Moncton, N. B. **L. H. Robinson,** division engineer, Halifax, was appointed assistant engineer maintenance of way, headquarters Moncton, N. B. **Alex. Scott, division** engineer, Charlottetown, P. E. I. appointed division engineer of the Halifax division with headquarters Halifax, N. S. **F. S. Wilkins** appointed division engineer, Island division, with headquarters at Charlottetown, P. E. I. **W. E. G. Chapman** appointed division engineer of the Edmunston division with headquarters at Edmunston, N. B.

Louis J. Owens, chief designer in the office of the engineer of buildings of the Burlington at Chicago, has been promoted to supervisor of power plants, reporting to the vice president in charge of operation.

H. W. Fenno, division engineer of the New York Central Lines west of Buffalo, with headquarters at Chicago, has been promoted to engineer of maintenance of way, with headquarters at Cleveland, succeeding **Charles Yoder,** deceased. **F. J. Jerome,** trainmaster on the western division with headquarters at Chicago, has been appointed division engineer, to succeed Mr. Fenno.



Charles S. Mellen

W. N. Hartman, supervisor of telegraph and signals of the central region of the Pennsylvania, with headquarters at Uniontown, Pa., has been appointed signal engineer of the Chesapeake & Ohio, and the Hocking Valley with headquarters at Richmond, Va., succeeding **C. A. Taylor,** assistant superintendent of signals, who has become signal engineer. The position of assistant superintendent of signals has been abolished.

C. F. W. Felt, chief engineer of the Santa Fe system with headquarters at Chicago, has been granted a leave of absence and **G. W. Harris,** assistant chief engineer, with headquarters at Chicago, has been appointed acting chief engineer of the Santa Fe system.

John A. Matthews has been appointed engineer in charge of maintenance and construction of the Altoona & Logan Valley Electric Ry., Altoona, Pa., he succeeds **G. S. W. Brubaker,** who resigned to enter other business.

Obituary

Charles Sanger Mellen, former president of the Northern Pacific, New York, New Haven & Hartford and Boston & Maine railroads, died November 17, at Concord, N. H., aged 75 years. Mellen was one of the most picturesque figures in an era in which railroad groups fought financial and rate battles that made transportation history. He made of the New Haven in the first years of his control a railroad of remarkable operating efficiency, but his desire for the expansion of the road, which led to the purchase of the Boston & Maine, the New York, Westchester and Boston; the New York Ontario & Western, trolley lines and steamship lines, stretched the finances of the company to a point where the stock tumbled and in July, 1913, he retired. Mr. Mellen was born in Lowell, Mass., on Aug. 16, 1852, and when a boy went to Concord, N. H., to live. He graduated from high school in 1867, when he was 15, and speculated as to whether he should go to Harvard or Dartmouth. A friend however, persuaded him to go to work as a clerk in the office of the Northern New Hampshire Railroad at Concord.

Ridgely Cayce, secretary-treasurer of the Louisville, Henderson & St. Louis, died at Louisville, November 9, after an illness of several months.

Charles B. Hoyt, formerly superintendent of track maintenance and construction of the Nickle Plate district of the New York, Chicago & St. Louis, died in Bellevue, Ohio, November 4.

Charles D. Ward, assistant to general manager of the Erie died, November 5, after an illness of only a few days.

Norman S. Rankin, special publicity agent and editor of the bureau of Canadian information, department of colonization and development of the Canadian Pacific, died October 28, in Montreal.

Judge Elliott M. Wilson, president of the Pacific Coast Steel Co. died, November 22. He was 82 years of age and had been ill for some time.

Jacob Reichert, superintendent of the Savannah division of the Central of Georgia and **B. R. Burch,** roadmaster were killed, November 24, while riding on a motor car near Covington.

Charles R. Hosmer, for many years identified with the development of the Canadian Pacific railway and the Bank of Montreal, died in Montreal after a long illness, November 14.

Frederick F. Fitzpatrick, president of the American Locomotive Co., died November 16.

H. G. Steinbrenner, vice president of the Industrial Brown Hoist Corpn., died in Chicago November 16.

William Hausmer Holt, chief engineer of the Duluth, Missabe & Northern, died November 10 at Rochester, Minn., after an illness of several weeks.

Norman Lawrence, vice president and director of sales of the Whiting Corpn., Harvey, Ill., died October 26 after a brief attack of pneumonia.

Nelson H. La Fountain, general supervisor of buildings of the Milwaukee, died in Chicago November 3.

James H. Cragin, general storekeeper of the Union Pacific at Los Angeles, died at his home November 28 of heart disease. Mr. Cragin was one of the oldest employes of the road in point of service having started with the road at Ord, Neb., in 1887. He was born at Salmon Falls, N. H., in 1859.

Judge George T. Reid, vice president and western counsel of the Northern Pacific Railway Co., with headquarters at Seattle, died Wednesday, November 30, at his home at Seattle, following a heart attack. Judge Reid was born April 2, 1871, at Etna Green, Ind. He was graduated from Warsaw, Ind., high school in 1888 and entered railway service in January, 1906, as attorney for the Spokane, Portland & Seattle Ry. during construction. He became division counsel of the Northern Pacific Ry. Nov. 1, 1908, at Tacoma, and on May 23, 1912, became assistant to the president and western counsel. On December 15, 1921, he became vice president and western counsel, which position he occupied until his death.

D. F. Milne, general superintendent of the Nickel Plate at Frankfort, Ind., died December 2, death apparently being due to heart disease.

William A. Patoon, formerly assistant to the president of the Pennsylvania and at one time president of the New York, Philadelphia & Norfolk, died at his home near Philadelphia on December 6. He was 78 years of age and retired from active railroad service in 1918.

George H. Benjamin, industrial engineer and patent expert, died at his home in New York on November 10.

Supply Trade Notes

J. D. Brandon has been appointed vice president of the **American Arch Co.** with headquarters at Chicago. Mr. Brandon entered the service of the Big Four R. R. in 1906, remaining with it until 1915 as general foreman at the Indianapolis shops. He then entered the service of the **American Brake Shoe & Foundry Co.** in 1915 at New York and in 1919 went to the service department of the **American Arch Co.**, at Montreal, where he stayed until 1924, when he joined the sales department of the **Pittsburgh Steel Products Co.**, leaving that position May 1, 1927 to return to the **American Arch Co.** as assistant to senior vice president which position he held until his new appointment as vice president.

W. W. Coleman, president of the **Bucyrus Co.**, has been elected president and chairman of the board of the **Bucyrus-Erie Co.** which has been formed to consolidate the **Bucyrus Co.** and the **Erie Steam Shovel Co.** which will become effective January 1. **E. K. Swigart**, vice president of the **Bucyrus Co.** has been elected senior vice president; **F. B. McBrier**, president of the **Erie Co.**; **A. C. Vicary**, vice president of the **Erie Co.**; **D. P. Eells**, second vice president of the **Bucyrus Co.**; and **W. M. Bager**, second vice president of the **Bucyrus Co.**, have been elected vice presidents of the new company. **G. A. Morrison**, second vice president of the **Bucyrus Co.** has been elected vice president and treasurer of the new company, while **J. G. Miller**, assistant secretary, has been elected secretary.

Arthur W. Cutten, of Chicago, **Fred J. Fisher** and **Clarence R. Bitting** of Detroit and **Joseph N. Ewing** of Philadelphia were elected directors of the **Baldwin Locomotive Works** November 17. Mr. Fisher and Mr. Bitting represent the Fisher Brothers and Mr. Ewing succeeds his father-in-law, **Dr. Thomas G. Ashton** who resigned because of ill health.

J. D. Brandon

J. C. Whitridge, vice president of the **Buckeye Steel Castings Co.**, Columbus, Ohio, has been elected president to succeed **S. P. Bush, resigned**, and will be succeeded by **J. B. Goodspeed.**

William H. Woodin, president of the **American Car & Foundry Co.** has been elected president of the **American Locomotive Co.**, succeeding **Frederick F. Fitzpatrick** who died November 16.

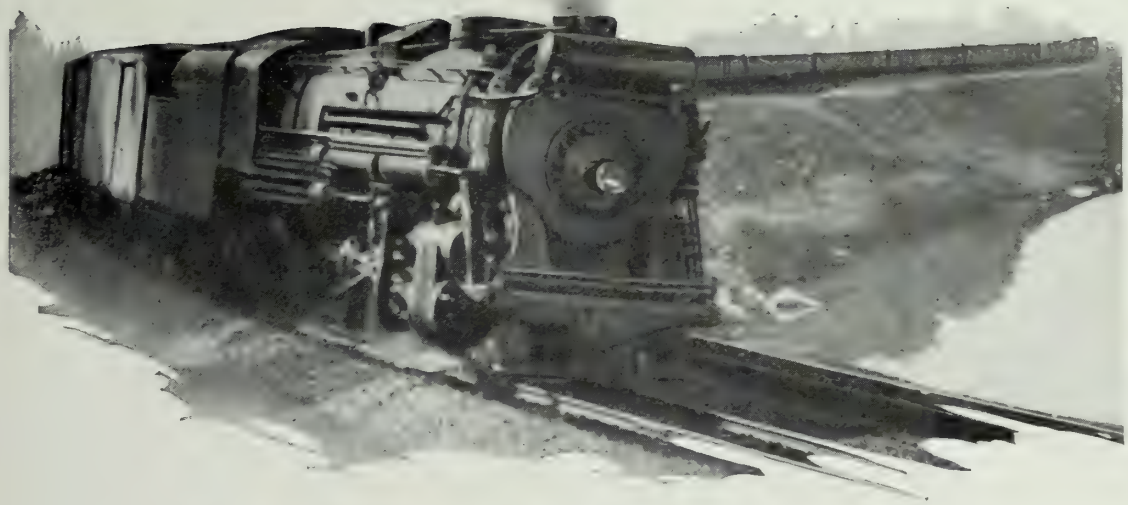
Saunders Jones, who has been vice president of the southern region of the White Co. with headquarters at Atlanta, is being transferred to the home office where, as vice president of the **White Co.** he will act as assistant to the president and have all the authority that goes with such a position. **C. B. Cowan**, who has been district manager at Birmingham, will take over Mr. Jones's work in the southern region as acting manager of that region pending appointment of a vice president.

Frank K. Tutt, vice president of the **Hanna Stoker Co.**, Cincinnati, has resigned to become special representative of the **Bird-Archer Co.** with headquarters at Chicago.

The **Gould Car Lighting Corpn.** has sold its patents, patent rights, trade marks, and good will in its car lighting business to the **Simplex Equipment Co. Inc.**, New York.

The manufacturing plant and entire business of the **Davenport Locomotive Works** has been acquired and will hereafter be conducted by the **Davenport Locomotive & Manufacturing Corpn.**, Davenport, Iowa.

The American Rolling Mill Co. has acquired the properties of the **Forged Steel Wheel Co.** and hereafter the forged steel wheel division of the rolling mill company will direct the sales of wheels. The **Standard Steel Car Co.**, however, still retains a substantial interest in the business, and will cooperate actively in the sale of forged steel wheels. **Harry Holiday**, formerly vice president of the wheel company has been appointed general manager of sales, with headquarters in the Frick building, Pittsburgh; **W. B. Quail**, formerly with the Standard Steel Car Co. is manager of sales for the eastern district,



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Elesco superheaters and Elesco feed water heaters are two of the major factors enabling you to turn this ability, strength, capacity into money, to get more tons over the road. They represent approximately 40 per cent of the capacity of the locomotive. The economies they bring are reflected in locomotive net earnings.

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FEED WATER HEATERS SUPERHEATERS EXHAUST STEAM INJECTORS
SUPERHEATED STEAM PYROMETERS

A-61

with headquarters at 50 Church street, New York. The Chicago sales office is in the Tribune Tower building and is in charge of **Wm. A. Libkeman.** The St. Louis office is in the Railway Exchange building and is in charge of **Blake C. Howard,** president of the Equipment Sales Corp. **C. G. Bacon,** formerly vice president of the **Forged Steel Wheel Co.** has become director of research.

The **Waugh Equipment Co.** has removed its New York City office from 100 East Forty-second street to 420 Lexington avenue.

Edwin S. Woods & Co., Chicago, have removed their offices from 230 S. Clark street to the Railway Exchange, 80 E. Jackson boulevard.

The **Lehon Company,** Chicago, has moved its New York office from 60 Broadway to room 430, 165 Broadway.

Joseph T. Ryerson & Son, Inc., Chicago, recently took over the distribution of the **Foote-Burt** line of drills to the railroads.

The **Hyatt Roller Bearing Co.,** Harrison, N. J. has just issued a very handsome book of 48 pages covering the application of anti-friction bearings to railway journal boxes and the many other uses to which Hyatt bearings are applied. The book is very handsomely prepared and profusely illustrated and shows that Hyatt-equipped journal boxes are now in service on more than 50 railroads.

Joseph T. Ryerson & Son, Inc., have taken over the exclusive sales of Glasgow iron billets to the railroads. Glasgow is a pure puddled doubly refined rolled wrought iron and is made by the **Glasgow Iron Co.** which was organized in 1876 and is situated at Pottstown, Pa. Glasgow iron is used for draw bars, equalizers and other car parts.

Andrew H. McDougall has been elected vice president and director of sales of the **Whiting Corp.,** Harvey, Ill. He was formerly vice president and consulting engineer of the same organization. **Melvin J. Evans,** sales manager of the **Republic Flow Meters Co.** has been appointed sales manager of the **Whiting Corp.**

The **Rollway Bearing Co.,** Syracuse, N. Y., has opened a sales office at 956 Leader Building, Cleveland. **R. D. Faris** is in charge.

The **Baldwin Locomotive Works** and the **Standard Steel Works Co.** have removed their St. Louis, Mo., offices from the Boatmen's Bank building to 1010 Pine street.

Henry D. Hukill has been appointed manager of the automotive brake division of the **Westinghouse Traction Brake Co.** with headquarters at Wilmerding, Pa.

It's Easy to Explain

This is Arthur Brisbane's latest contribution to the gaiety of nations:

> The Canadian Pacific Railroad, the stock of which went climbing yesterday, is operated in a country with population smaller than that within forty miles of New York's city hall. What makes Wall street pay such high prices for a Canadian railroad?
>
> How do you explain the Canadian government's ability to operate Canada's national railroads, national telegraph and telephone systems well with a profit?

The Canadian Pacific stock climbs high because it pays dividends.

It pays dividends, (1) because it is privately owned—not owned by the government, as the uninformed person might be led to believe in reading Mr. Brisbane's paragraph.

(2) Dividends are possible because the road is permitted to function unrestricted by thousands of more or less unnecessary laws and regulations.

(3) It pays dividends because railroad taxes in Canada are only a few hundred dollars a mile compared with taxes of $1,000 to $2,100 a mile in the United States.

The Canadian government does not show a profit on the railroads it owns. The 9,000,000 inhabitants of Canada, without having a chance to vote on the question, were loaded down with 22,000 miles of poor railroad several years ago. In desperation the Canadian government employed an American railroad man, Sir Henry Thornton, formerly of the Pennsylvania System.

Sir Henry has done wonderfully well. The Canadian National Rys. are 75 per cent better in every way than when this American railroader took charge of them, but they pay no profits to anyone.

Every man, woman and child in Canada has been taxed more than $15 a year to defray the cost of this boneheaded adventure in government ownership.

Whenever you can compel the people to supply the money—without interest charges—to carry on a business enterprise you can, ordinarily, show a profit—on paper.

Honolulu in 40 Hours?

Financial backers of Johannes Plum, Danish inventor, whose speed boat was driven at 63 miles an hour by Mrs. William B. Leeds, November 17, have announced they will finance a test run from San Francisco to Honolulu in the spring.

Plum will attempt to drive the boat at an average speed of 50 miles an hour and cover the distance of 2000 miles in 40 hours. The present record is four and a half days, made by the steamship Great Northern, a transport, during the war.

He expects to attained a maximum speed of 65 miles an hour, alternating with lower speeds to rest his motor.

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Every room an outside room with two large windows; large single rooms size 11x6x20 with bath, $4.00 per day; for two, $5.00—twin beds, $6.00. Large double rooms, twin beds, bath, $6.00 per day. Special weekly rates. Furnished or unfurnished suites with serving pantries, $95 to $150 per month.

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Steel and Composite Cars

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CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industry

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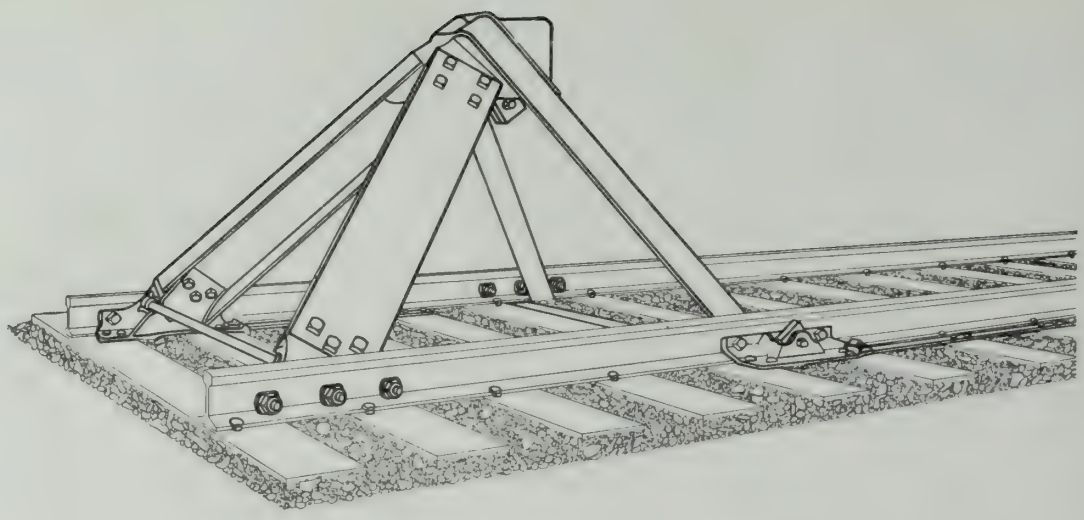
Vol. II January, 1928 No. 1



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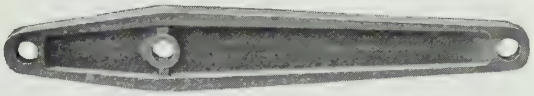

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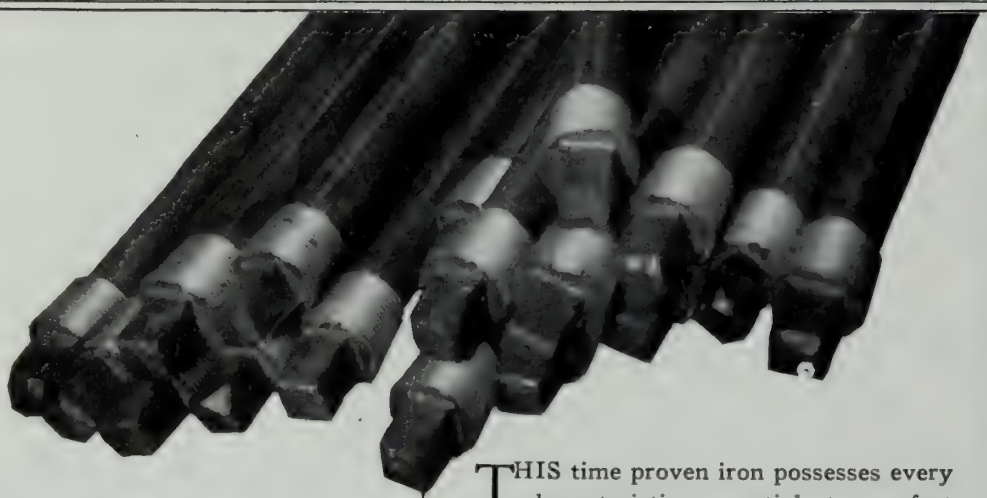

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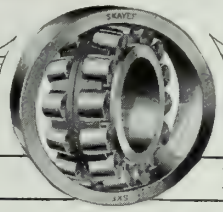

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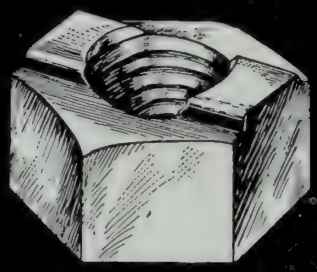

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Transportation

The Monthly Magazine of the Transportation Industry

JANUARY, 1928

VOLUME TWO NUMBER ONE

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Railroading

The Year that's Gone and The Year to Come

By Charles Dillon

IN THE last seven years, that is from the beginning of 1920 to the end of 1926, the Class I railroads of this country have added 5,200 million dollars to their properties in capital investment.

During the first nine months of 1927 the total new investment was 570 million dollars, while the indications for the year are that a total capital outlay of about 750 million dollars will be recorded. This will make an eight-year total of nearly six billion dollars.

In a few words, this explains to some extent how the American railroads have increased their efficiency. It shows, too, how these great transportation properties have gone competently about the business of preparing for their increasing public responsibilities.

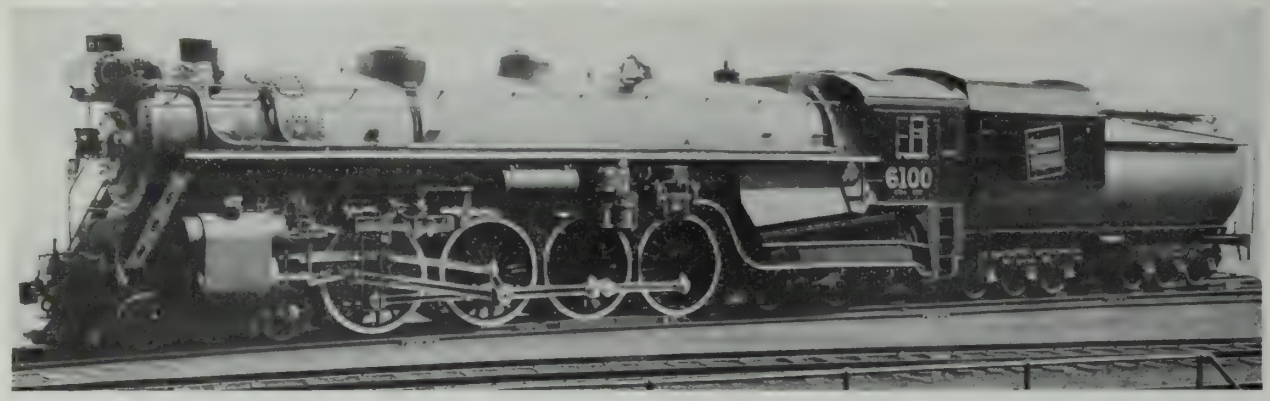
The report of the bureau of railway economics to the American Railway Association, most of which was printed in these columns last month, points out just how this marvel of efficient railroading has been achieved, and why the roads today are ready for practically any burden the public may see fit to impose—if it doesn't take the form of more restrictive legislation.

American railroads have regained, through their own fine performances, whatever standing they may have lost in the good graces of the public. This has been rather conclusively shown in the money markets. Practically one-fifth of all railroad financing for the first ten months of 1927 was accomplished through the sale of stock, the highest such ratio during any corresponding period for several years.

For a few years it seemed as if the mounting total of mortgages was about to absorb the owners' equity in the properties. Interest payments reached a staggering total, a situation not chargeable to anything the railroad managements had done or failed to do. It was due to a state of mind, the public mind, created by adverse legislation and the most discouraging forms of regulation. No investor had any assurance of a fair return on his money if he put it into stock of railroads because this stock, as not all laymen know, gets nothing until interest on bonds has been paid.

The Tightest of Box Cars are Required for Wheat If You Wish to Avoid Claims, and Trains of This Kind of Equipment Represent Millions of Dollars Invested.

But a change has come. It has come through the public's satisfaction with railroad service, and no public anywhere in the world expresses itself more promptly than in the United States of America. This satisfaction was demonstrated during the first ten months of 1927 when railroad financing totaling $872,323,687 was reported of which nearly 175 million dollars was accomplished through the sale of stock. Of this new stock nearly 85 millions went for refunding purposes—comparable to getting an extension on your note at the



The New 6100 Northern Type Locomotive, Forty of Which Are Being Built for the Canadian National Rys. This Mammoth Locomotive is the Largest of Its Kind in the British Empire. Photograph by Canadian National Rys.

bank, and making a new note. This is some reason for gratification.

In the first ten months of 1926 railroad financing amounted to $351,592,000, of which only $10,240,000 was accomplished through the sale of stock. The rest was handled through the sale of bonds, thereby increasing the carriers' funded indebtedness. New financing for the first ten months of 1925 stood at $473,388,730, of which $16,218,230 was stock. This compares with total financing of $872,693,437 in the first ten months of 1924, of which $37,823,737 was stock; and with total financing of $408,650,000 in 1923, of which $15,300,000 was stock.

The report of the bureau of railway economics shows, however, that the enormous investment increases in 1927, alluded to in the foregoing, was made despite revenue reductions about which the average person knows little or nothing, and about which he ought to know a lot more. The report shows for one thing that during the first 42 weeks of 1927 revenue freight car loadings were 42,606,456. These loadings ran almost consistently ahead of those for 1926 up to the third week of May, and since that date ran just as consistently behind.

Measuring the railway freight traffic in terms of net ton-miles, a somewhat similar picture is presented. Up to June, the net ton-miles of railways of Class I were greater month by month than in 1926, but for every month since June they have run below those of the previous year.

For the first ten months in 1927, the volume of freight handled by the Class I railroads amounted to 402,848,468,000 net ton miles. This was a decrease of 2,377,318,000 net ton-miles or six-tenths of one per cent below the corresponding period in 1926 but was 6.7 per cent above the same total for 1925.

Railroads in the eastern district for the ten months period reported a decrease of 1.4 per cent in the volume of traffic compared with the same period in 1926 while the southern district reported a decrease of 2.4 per cent. The western district reported an increase of 1.3 per cent.

Big Plans for Canadian National

By S. J. Hungerford,

Vice President, Canadian National Rys.

OUR plans for 1928 are not at this date complete, but some important matters loom up as worthy of mention. We were able, during the present year, sufficiently to develop our proposed plans, in connection with rearranging and co-ordinating our Montreal terminals, to the point that we could make them public, and they have been filed with the board of railway commissioners for Canada. The scheme is a comprehensive one, embracing both freight and passenger terminals, which provides for a new central passenger station with electric operation for all trains using it, entrance being by the former Canadian Northern tunnel for trains from the North and West, and by means of overhead structures from the East and South. If our plans are approved, and they have been very well received to date, a start on this project, which, as affecting the Grand Trunk lines has been a matter of discussion and much concern for many years, would make an event of very great importance, involving a considerable expenditure.

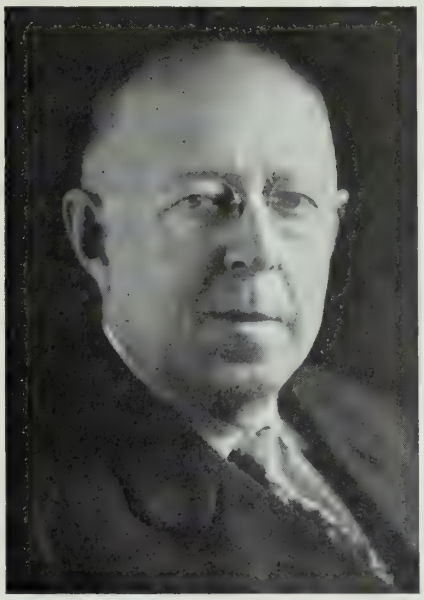
A new mineral development looms up as of major importance and involves the building of a branch line of railway 85 miles in

length from a point on the Hudson's Bay Line to the Flin Flon Mines, which are situated approximately on the boundary between Manitoba and Saskatchewan at a point about 400 miles north of the United States boundary. A very large expenditure is contemplated in this area in connection with the development of this project, and, as it diversifies the production of two so-called Prairie Provinces which have been regarded as almost entirely agricultural, the enterprise is looked upon as of great importance.

During the year, the new Union Station in Toronto, which was erected before the war, but to which the track connections had not been built, was opened for traffic, although the track layout is not yet completed, and the present operating arrangement is a temporary one. The necessary facilities to complete the plan are under construction.

During the year, a start was made on an important extension to the Chateau Laurier hotel at Ottawa. A decision was also reached to build a hotel and new station at Halifax, N. S. Agreement was also reached with the city of Vancouver, under which the railway will begin construction of a hotel at that point by November 1, 1928, to carry out an obligation of the former Canadian Northern System.

During the year, the railway made a notable addition to its motive power by obtaining delivery of 40 of the 6100 class, Northern type, 4-8-4 locomotives with Vanderbilt tanks. Diesel oil electric cars were developed and put into service with most satisfactory results.



E. J. Pearson

The business outlook in Canada for 1928 is good. There should be a large grain movement in the first part of the year, which generally stimulates business. The industrial activity in Northern Quebec, especially in the Lake St. John region, is a particularly favorable factor in the outlook.

During 1927 wage adjustments affecting large groups of our employes were made; consequently, operating expenses will show a substantial increase. Our expenditures for maintenance of way and structures have been on a somewhat higher scale than formerly, and, roughly, transportation expenses have increased almost correspondingly with the increase in gross earnings. Consequently, the year's net return will be somewhat below that of last year, but, nevertheless, the year must be classed as a good one in comparison with any other year than 1926, as net earnings are expected to be ten million dollars more than in 1925.

In line with other New England lines, the Central Vermont Ry., now a part of our system, suffered a disastrous loss by reason of the floods which occurred early in November, and it is certain that a very large expenditure will be required to rehabilitate the flooded portions of the lines.

Downward Tendency in Rates is Dangerous

By E. J. Pearson,

President, The New Haven System

FROM the present outlook the volume of traffic of the New Haven System in 1928 should be substantially the same as in 1927 which, while not equal to 1926, represents a reasonably normal year. Except for adverse conditions which cannot now be foreseen, and which seem unlikely, the results for the coming year should compare favorably with the past.

During the past ten years large expenditures have been made for improvements in plant and equipment, as a result of which the New Haven is today in better condition than for many years, and in position to handle larger volumes of traffic than the heavy movement of the past few years with continued satisfaction to its patrons.

Study recently made by the American Railway Association indicates that unless there should be an abnormally large volume of traffic in 1928, which seems unlikely, there should be no danger of an equipment shortage. There are, however, signs that in some respects transportation capacity of the railroads as a whole is in danger of becoming crowded, and that if the generally high character of service of the past few years is to be continued, careful attention must be given to the development and provision of increased facilities to care adequately for future growth of traffic.

A continuation of the disturbing tendency of the past few years

A Special Train a Mile Long on the Santa Fe, Carrying Automobiles Across the Country for the Thrifty Citizenry to Use instead of Riding on Passenger Trains, Which, By the Way is the Cheaper Form of Travel, Should Anyone Ask You

toward decreases in freight rates, as indicated by the downward trend of revenue per ton mile, will hamper the railroads seriously in carrying out the further programs of expansion necessary to insure continuance of the good and adequate service in the recent past. A clear responsibility rests upon the Interstate Commerce Commission and the railroads for scientific adjustment of rate schedules to the end that they will be equitable for all classes of traffic, and produce revenues sufficient to maintain a sound condition of railroad credit, without which the funds for necessary expansion of facilities cannot be provided.

All's Well Along the Santa Fe

By W. B. Storey,

President, A. T. & S. F. Ry.

THE YEAR now closing has presented no outstanding features so far as the Santa Fe and its territory are concerned. From an agricultural standpoint the major crops, consisting of wheat, corn, oats, hay, the sorghums, cotton, citrus fruits, and grapes, averaged up satisfactorily, and prices have been fair. The live stock industry has showed improvement compared with recent years. Manufacturing and mining have been carried on at a fair percentage of capacity.

Due to continued over-production, the oil industry has been showing rather a poor return, and development activities have been restricted. There has been rather less building this year than last and the lumber companies have not made large earnings, although their production has been fairly large. Bank failures have been fewer than in the last few years and some institutions which were in a precarious condition the early part of the year now seem to have reached a position of safety.

W. B. Storey

The Santa Fe has been engaged in only minor construction projects, completing the line from Pawhuska to Ralston, Okla., 30 miles, and the White Deer branch in the Texas Panhandle, 11 miles. Some 116 miles of second track have been added and 575 miles of 110 pound rail have been laid on main lines in lieu of lighter rail. Fortunately no great damage from floods, such as occurred in the lower Mississippi Valley, affected any of our territory, although our roadway did suffer somewhat from floods in Kansas and in southern California; but

the general benefit to the latter state from the ample water supply is abundant compensation for the damage.

The outlook for 1928 is quite satisfactory in every direction. There is a reasonable feeling of optimism among the citizens of our territory, although no boom anywhere is expected. The Santa Fe railroad plant is in first class condition and will be kept so. About the usual program of improvements and additions to equipment, roadway, and structures is now contemplated as it is our policy to work along a fairly even program in order that we may always be prepared for any traffic demands which may be made upon us.

Operating Costs Up and Rates Down

By Columbus Haile,

President, M-K-T Lines

IN COMMON with most other Southwestern Lines, the M-K-T has transportation capacity more than ample to meet traffic requirements. While we shall continue the liberal improvement policy that has been followed for several years past, neither new equipment nor enlarged transportation capacity is needed. Our improvement program for 1928 consequently will include only projects calculated to produce results in the way of operating economies rather than enlargement of transportation capacity.

While our improvement plans for the year are not complete, we contemplate improvement expenditures of approximately $5,000,000.

Columbus Haile

Traffic volume for the year in the Southwest is always so contingent upon agricultural conditions that forecasts at this season are necessarily conjectural. While conditions at this time indicate decreased movement of some commodities, we should be able in 1928, with normal agricultural production, measurably to maintain the traffic volume of 1927.

Continuing trends toward lower levels of average rates, combined with further loss of passenger revenue, which, in the light of experiences since 1920, must be anticipated, with accompanying tendencies toward higher operating costs, are likely to be reflected adversely in the net earnings. Indeed, without an increase in traffic volume, which now may not be anticipated reasonably, increased net earnings in 1928 are hardly to be expected.

Good Times Coming, But no Boom

By W. L. Ross,

President, The Nickel Plate

SIGNS point to increased business for the railroads in 1928. I look for substantial traffic improvement over the volume of 1927, although my optimism does not run to anything like those predictions of phenomenal increases that I have heard and read about during the last few weeks.

My expectations fall short of record-breaking revenues and traffic volumes. I am inclined to think that, for the railroads generally, the results will be considerably under 1926, the best year, but that they will approach reasonably close to the figures for 1923, when operating revenues of Class I roads totaled over $6,357,000,000. In the case of the Nickel Plate, railway operating revenues in 1923 exceeded the figures for 1926 by something like two and a half million. I look for our own results to come nearer to the latter than to the former year's figures. In other words, I think the railroads are headed for what may be termed their "third best year"; this, despite the general conception that a "Presidential Year" does not invite prosperous business conditions.

Railroad traffic is, after all, the reflection of the conditions generally, the composite picture of how

things fare with industries and trade as a whole. My hopes with relation to the railroads, therefore, presupposes prosperous general business conditions. Throughout the Ohio industrial districts, and through the Middle West, for that matter, one is encouraged that conditions will be good in 1928. The industries appear not only hopeful, but they seem to have practical reasons for their optimism. One is told that steel has hit its bottom, and any change is bound to be upward; that farmers have had a prosperous year and that "farm dollars" will get into circulation early in 1928, and that, finally, assuming no undue tightening of money conditions, business is bound to improve in large measure.

I fall in line with this consensus that improved business activity is just around the corner of 1928. I believe we are in for substantially improved conditions, but not a "boom" or record year.

With Billions in the Nation's Banks

By F. W. Sargent,

President, Chicago & North Western

THE outlook for 1928 is encouraging. There are many definite characteristics of business which have been manifest during the past year to support this conclusion. The income of the nation is constantly increasing. In 1926 it had reached 90 billions of dollars. Savings bank deposits exceed 26 billions. This is a great reservoir of wealth available to industry.

Of course, constant changes are taking place in the economic life of the country. This is especially true in the building industries where brick, concrete and steel have to a considerable extent displaced the products of the forest. More machinery is being used on our farms, and with good results; good highways abound, and credit is plentiful and provides a stimulus for all sorts of activities. Business and industry are in a constant state of change, which means progress. Generally speaking, our business men have demonstrated their great genius in meeting these changes and adapting their methods and their industries thereto. The year 1927 has witnessed an effort on the part of consumption to catch up with production, and the indications now are that 1928 will evidence a fair balance between these two fundamental factors, each indispensable to a prosperous economic condition.

Crops in the northwest territory in 1927 were good. Old debts are being paid off. Savings bank deposits are on the increase and wages are reasonably stable. The impetus which these influences will give to business in the coming year should not be lightly considered, and can be relied upon to exert a real force for good in the future.

F. W. Sargent

Of course, a presidential campaign is usually an open season for the radical agitator and the political demagogue. Such activities frequently upset the thinking of a certain percentage of our reasonably conservative business men. I feel, however, that the conditions altogether which underlie business at this time present the most formidable opposition to these unfavorable activities that we have ever known on the eve of a presidential campaign.

So far as the Chicago & North Western Ry. Co. is concerned, we are preparing to go forward as usual with our program of maintenance. While in common with certain other railroads, especially in Western Trunk Line territory, we have been dealt some severe blows in the matter of rate regulations, yet we have faith in the ultimate justice and fairness of our administrative authorities, and it is our policy to go forward in 1928 with our enlarged improvement program.

Milwaukee Had Big Grain Traffic

By H. E. Byram

Co-Receiver, C. M. & St. P. Ry.

We have no definite plans for the year 1928. As you know, the question of termination of the receivership is now awaiting approval of the Interstate Commerce Commission for the issuance of the necessary securities, and if this decision is favorable the receivership will be ended soon after it is rendered. Therefore, it is not possible for the receivers to make

any definite plans at this time concerning 1928.

In regard to the business outlook for next year: The territory in which our line is situated has harvested abundant crops this year, and as agricultural products form such a large part of the traffic of this railroad we feel the outlook for 1928 is favorable, although at the present time our loadings are less than they were last year.

I think the outstanding accomplishment of our railroad this year was the handling of the very large grain crop without any car shortage or delay.

Higher Commutation Rates Are Necessary

By G. Le Boutillier
Vice Pres., Long Island RR. Co.

It is almost impossible to say what our improvement plans are for 1928. A great deal depends upon the result of our application for a 20 per cent increase in commutation rates now pending before the regulatory bodies of the state of New York. A decision in this case is expected December 31.

H. E. Byram

We are, in addition to our usual construction program, confronted with demands for the elimination of grade crossings running into many million dollars. Just how far we will be able to go depends as I have said before, upon the outcome of our rate case.

During 1927, we handled more tons of freight and more passengers than ever before. There was, however, a slight falling off in our long distance passenger traffic. The increased passenger business was in the suburban zone.

Coal, the Important Thing

By C. H. Hix,
Pres., Virginian Railway

We have nothing special in our next year's budget other than ordinary side track extensions and small expenditures of that kind which would not justify mention.

There has been a gradual slowing down of business with us for the last several months and we suffered the greatest depression in October and November of any month for a number of years, but I know of no reason why we should not have good business when the weather is suitable. The fall so far has been entirely too warm to stimulate the principal commodity this road handles — coal. We got along in 1927 very well, with exception of the depression in coal.

The L & N Makes a New Freight Record

By W. R. Cole

President, Louisville & Nashville

WHILE it is, of course, too early to forecast with any degree of reasonable accuracy the railroad outlook for 1928, yet in the light of the immediate future I believe the prospect is, on the whole, favorable. The commercial activity in the thirteen states of the South through which the lines of the Louisville & Nashville operate has been satisfactory during the past year, and since the general business development of the South is holding up, I see no reason why the next twelve months should not produce results as favorable as those for the year now coming to a close.

The volume of freight handled by the L. & N. in 1927, based on the returns for the first ten months, will exceed all previous records. The passenger business is, of course, falling off badly, but the continued heavy movement of freight traffic is an indication of the manner in which the commerce is holding up. The L. & N. was able to handle this record business in a satisfactory manner. As an indication of the improved efficiency of operation it is noteworthy that several new records of performance were established. This has been the result of improved conditions generally, but it has followed particularly from the large amount of improvement work which, for the past several years, has been carried on by this company. It may be of particular interest to state that since the end of federal control the L. & N. has authorized and appropriated an aggregate of nearly $170,000,000 for work of this character.

It is, of course, our intention, in order to keep abreast with the demands and further improve the capacity and efficiency of our property, to continue to make such improvements, and we shall start the year with an unexpended balance already appropriated for new improvements aggregating a total of about $18,500,000. Since this company does not prepare a budget of its contemplated expenditures from year to year but undertakes to make such improve-

ments as the conditions warrant, it is of course safe to say that the appropriation will be very substantially enlarged as the year progresses.

The Importance of Henry Ford's Business

By A. C. Needles
Prest., Norfolk & Western

Although there has recently been a slowing down of production in basic industries, such as coal, steel and motors, it is likely that the improved agricultural situation and the resumption of production by the Ford interests will tend to stimulate business. I look for general business conditions in 1928 to be relatively as good as in 1927.

Locally we expect some reduction in total business and gross earnings. While merchandise business continues to move in good volume, reflecting the increasing development of this section of the country, our coal movement, which normally approximates about 70 per cent of our total business, is somewhat reduced, and this latter condition will doubtless extend into 1928.

W. R. Cole

While during 1928 we shall continue our program of keeping our property and equipment in first class condition, we do not contemplate making any large capital expenditures.

Crops Should Mean More Business in 1928

By W. H. Bremner,
Receiver, M. & St. L. R. R.

We are not contemplating any special improvement work in 1928.

As to the general business outlook for the year, it is very difficult to make any forecast. Here in the Northwest with the increase in purchasing power of the farmers brought about by the good crop of this year, there is every reason for looking forward to the new year with a good deal of confidence.

General traffic in 1927 has shown a falling off as compared with 1926. This has been offset to a great extent, however, by the good crop, and we will finish the year with a net somewhat greater than that of last year.

Election Year Bugaboo in the Discard

By L. A. Downs,
President, Illinois Central System

A SURVEY of business conditions as they bear upon prospects for the future leads to these general conclusions:

That business as a whole, notwithstanding admitted exceptions in individual instances, fundamentally is sound;

That the dark spots which have appeared in the business picture in the recent past are mostly transitory in nature;

That there is a marked predominance of favorable over unfavorable factors in the general situation; and, finally,

That there is no cause for apprehension over the prospects for business as a whole in the near future.

These conclusions call for some explanation.

For one thing, I believe we can disregard the election year bugaboo. Belief that election year necessarily is a bad year for business happily has gone out of style, and, since the matter is chiefly psychological, that is even more important than the fact that there is no reason to be fearful that the election of 1928 in particular is likely to have any material effect upon business in general. If we have made such progress in our economic thinking, and I believe we have, it is worthwhile progress.

One of the most significant developments of the last year has been the substantial improvement in the condition of agriculture, and this improvement should have a good and a far-reaching effect upon business as a whole. The serious predicament in which a large and increasingly important part of our country found itself as a result of the great over-production of cotton in 1926 and the disastrous floods of 1927 has been partly alleviated. Good prices prevailed for the cotton crop of 1927 with the result that, despite the very large decrease in production, it brought the growers an aggregate return greater than they received in 1926. Elsewhere, agriculture has made appreciable gains through good crops and better prices, and along with the upward trend of farm prices there have been decreases in the prices of many non-agricultural products. These counter trends have helped immensely to increase the purchasing power of the farm popu-

lation, and to place agriculture more nearly on a parity with other industries and occupations than it has been at any time in recent years.

Other factors underlying the business situation as a whole which indicate the fundamentally sound condition of the country at present are the amicable relations which generally prevail between men and managements, the employment of labor at what is relatively the highest wage scale on record, the ability readily to finance business undertakings of demonstrable merit, and the large volume of construction under way and in prospect.

There is the further fact that a prospective demand for goods and services is assured by the virtual abandonment of forward buying for speculative or other reasons. So-called hand-to-mouth buying, whatever its vices may be, has the important virtue of insuring the presence of an unfailing demand for the products of business activity. When business follows the day-to-day needs of the country, as it has so closely in the last three or four years, it may and will vary, but it cannot fall below the level of these ever-present needs, and an increase in consumption must immediately be reflected in increased business activity. We are therefore assured of having business sufficient to sustain the economic life of our large population; there is that much to start with and a promise of increased business as consumptive capacity increases.

There has been some lessening of activity in a good many industries as a result of the suspension of manufacturing in the Ford plants. The return of the Ford Motor Co. to a heavy production basis is certain to have a salutary effect upon the automotive industry generally, and this in turn will tend to stimulate the demand for iron, steel, rubber and other products, to increase railway traffic, and to add to industrial payrolls.

L. A. Downs

The financial situation of the railroads is so important a factor in the determination of business conditions that it deserves separate consideration. Any change in the earning power of the railroads is reflected quickly in the activity of all the great industrial groups. When it is considered that the railroads of the country consume one out of every four tons of coal mined and one out of every three tons of steel produced in the United States; that they take virtually the entire output of all the vast locomotive and car manufacturing plants; that they use a large part of the output of numerous other producers and manufacturers, and that their employes number perhaps one out of every 20 persons gainfully employed in the country, the effect of their prosperity or lack of prosperity is at once apparent.

The railroads must continue to spend money both for the enlargement and for the improvement of their facilities, and in order to provide the service that all other kinds of business must have they must spend money for the pay of employes and for the purchase of the materials and supplies used in operation. The need of adequate and stabilized earning power for the railroads as a whole is therefore a need in which virtually everyone shares directly or indirectly. The railroads can be expected to spend money with these far reaching benefits in proportion to their capacity to spend as measured by their earnings.

The net return earned by the railroads in 1927 is much less than they earned in 1926 for three principal reasons, a decrease in traffic, a further decline in the level of rates, and the award of wage increases to large groups of employes. With no thought of complaint, but in order that the public may know and appraise the facts, it should be pointed out and emphasized that a weakening of railway earning power has an adverse effect upon every line of business in every part of the country and upon every owner and every employe.

What Do You Mean--Railroad Problem?

By E. E. Loomis,

President, Lehigh Valley R. R.

THERE seems to be nothing in the general prospects for 1928 calculated to cause concern to the railroads. It is my belief that seekers for a solution of the railroad problem this year should first be compelled to explain what problems they have in mind. With the carriers giving the best service in their history and the great bulk of the shipping and traveling public plainly manifest-

ing general satisfaction, it is difficult to understand all the talk on the subject of a railroad problem. If there has been one in the past undoubtedly, it has been answered satisfactorily by the men who have made the service what it is today.

Under the circumstances, it becomes apparent that the railroad problem of today, if there is one, is not within the carriers themselves but is something those outside their ranks are seeking to impose on them. If the railroads are permitted to proceed along present lines, concentrating their whole effort upon the effectiveness of their service to the public, I believe there is nothing to the situation to be faced in 1928 calculated to give the slightest concern to those interested in and dependent upon good transportation.

Seemingly, however, persons bent on providing a railroad problem are not to be deterred by this state of affairs. Of course, there is the chronic demand for lower freight rates from those who presume to speak for the farmers. The clamor continues despite the fact that it has been clearly demonstrated that the market prices of many agricultural products frequently fluctuate every 30 days, and in some commodities such as wheat and corn, every 24 hours, more than the entire freight rate on such commodities from farm to destination, showing conclusively that freight rates have little or

E. E. Loomis

nothing to do with the farmers' problem, their problem being one of marketing. In my opinion, even if the railroads should carry agricultural products for nothing, after a short while what previously was paid for transportation would be completely absorbed through the middlemen between the farmer and the consumer, and the farmer would find himself no better off than he is today.

On the other hand, at no time since the passage of the Transportation Act in 1920 have the railroads earned a fair return upon the book value of their properties. Their best showing was in 1926 when they earned 5.13 per cent., but they were $83,000,000 behind this record in the first nine months of 1927, and it seems certain their final return for the year cannot exceed 4.75 per cent.

In the seven years since the end of government control, the railroads have failed by more than two and a half billion dollars to earn the fair return the Transportation Act provided for, and had they really had the guarantee some have mistakenly contended the law gave them, this staggering sum would have been due the carriers.

The railroads of the United States pay more than a million dollars a day in taxes, and this is worth bearing in mind when it is remembered that at the same time they give America not only the best service in the world but at lower rates than in any other country.

So far as the Lehigh Valley Railroad is concerned, we expect a busy year. We are engaged in some important construction projects, including a new double tunnel through Musconetcong mountain and a new bridge across Newark Bay, including at the same time a re-arrangement of our Oak Island yards and facilities. Work on these improvements will be pushed steadily, while at the same time no effort will be spared in seeking to make our freight and passenger service as efficient as is humanly possible.

Good Year and Another One Coming

By P. E. Crowley,

President, New York Central

THE close of 1927 marks the ending of another year of prosperity for the country. The situation as to the railroads appears to be satisfactory, from a business point of view. They have handled, during the year, enormous amounts of traffic, and have handled it expeditiously and efficiently. The physical condition of the roads is, as a whole, good; the roadbeds are well maintained, the rolling stock is kept up to a high standard of efficiency, and the railroad forces are performing their work in a satisfactory manner.

The cordial cooperation which exists between the shipping public and the railroads has resulted in a more prompt loading of cars by shippers, more prompt unloading by consignees, and has kept freight cars more constantly in motion. Car shortages, which at one time in railroad history were frequent and serious, have practically disappeared; and with the contin-

uance of the conditions as to high standards of maintenance, and as to cordial relations between the roads and their customers, the roads will furnish as good and adequate service during the coming year as they have furnished during the year that is now closing.

No reason seems to exist to cause us to anticipate a serious lessening of traffic. Soft spots have appeared here and there in the business world, but they are not of such magnitude as to cause apprehension for the coming year.

The continued prosperity of the country and the increasing credit of the railroads as a whole make railroad financing a less difficult problem than it was some years ago. If additional financing for individual roads becomes necessary during the year on account of additions and betterments, or retirement of old security issues, or for other reasons, I do not believe they will find it difficult to obtain what money is needed on reasonable terms.

P. E. Crowley

Expenditures for equipment, materials and supplies during 1928 should be normal if the expectation of continuing business is well founded.

Railroad consolidations have made small progress during the year, and it is not reasonable to expect that greater progress will be made until the present law is changed in such a way as to permit a practical solution of the problems which exist, and which cannot be solved under the present law.

Through the courtesy of the New York Central Lines we are enabled to present on the cover of Transportation, this month, a reproduction of a famous painting, known all over the world, showing that company's Twentieth Century Limited in a snow storm. We regret that limitations of space make it mechanically impossible to show the entire painting which includes, at the right, an old fashioned sleigh, and a team of tired horses contending with the drifts.

Increased Use of Electric Current

By Gerard Swope,

President, General Electric Co.

THE electrical manufacturing business for 1927 has, on the whole, been satisfactory, and about the same in volume as the previous year. The use of electric current in homes and factories has increased 7 per cent over 1926, and with the exception of 1921 has shown an increase every year since 1919 when the index was first prepared, and the consumption in 1927 was more than double what it was in 1919. This is becoming one of the best indices of general and industrial conditions in America.

The outlook for 1928 is, on the whole, favorable. Economic conditions are sound and the satisfying of the demand of 120,000,000 people should provide ample business activities with the usual attendant improvement in the art. Earnings of labor have never been so high. With a continuance of good business their earnings should continue and employment become steadier.

Coal Strike Caused Big Losses

By Hale Holden,

President, C. B. & Q. R. R. Co.

GRANTED normal crops, which naturally furnish the most important items of traffic for western roads, and no further suspension in the coal mining industry, I see no reason to doubt that the volume of freight business in this territory in 1928 will be at least as good as it has been during 1927. The good crops in most of the western territory, this year, have brought into the country a large amount of new money and aided industry in many ways. Agricultural conditions are steadily improving. While I see no basis upon which to predict any substantial increase in business activity, at the same time I see no substantial reason to doubt that business, next year, will be at least as good as it has been in the last 12 months.

The bituminous coal strike, last-

ing six months in this year, produced serious losses to roads such as the Burlington that originate a large volume of coal traffic, and in addition threw an increase in expenditures on them, made necessary by the purchase of coal at distant points where mines were in operation. In spite, therefore, of the better crop results in 1927, the consequences of the bituminous coal strike will result in somewhat less net earnings than in 1926.

The outstanding accomplishment of this year has been the ability in the face of continued reductions in rates and increases in wages and other costs of operation to continue to find better and more economical methods of operation, and thereby to preserve even the moderate net return which has been earned.

They're Surely Optimistic Down South

By J. B. Hill,

President N. C. & St. L. Ry.

IN THE South conditions are sound fundamentally, and would seem to forecast for 1928 a continuation of prosperity. Crops have been good, and I believe farmers are in better condition than at any time since the war; the banks have an abundance of money which can be had at as low interest rates as have prevailed in years.

Industrial development in the South continues to increase as the advantages of natural resources, labor supply and superior climatic conditions become more generally appreciated. How far these conditions will be changed by reason of a presidential election I should not be willing now to forecast.

President Hill of the N. C. & St. L. Ry.

So far as this railway is concerned, I believe that it will continue about its normal expenditures for improvements during 1928. Such improvements as will be made, however, do not represent any expansion of plant but merely betterments of facilities.

By reason of tremendous losses of local and through passenger travel, due to the competition of highway motor transportation, both private and commercial, the gross earnings of railroads from that source will continue to be reduced, as the good roads program expands.

With constant increase in taxes, the higher wage scales growing out of compromises and arbitration produced by the existing law, and the constant tendency on the part of individuals, associations, and commissions gradually to force a lower rate level, it will be very difficult to hold the net earnings to even as high a point as heretofore.

I believe, in general, however, the South is optimistic for the future.

Oil Made Up for Lower Wheat Traffic

By J. E. Gorman,

President, Rock Island Lines

THE prospects for a good volume of traffic in the territory served by the Rock Island Lines for 1928 are at the present time favorable.

Traffic in 1927 was largely influenced by the failure in part of the wheat crop, the handling of which plays such an important part in the general traffic conditions of railroads in the Southwest. Were it not for the very heavy tonnage, both in and outbound, which this company enjoyed from the Seminole oil fields, the lack of movement of grain would have affected its revenues seriously.

We have every reason to feel that the wheat crop in 1928 will be a very large one. Soil conditions are excellent throughout the territory, and in the four large wheat states served by the lines of this company there is an increase in acreage planted of 1,714,000 acres, or 7½ per cent. as compared with the previous year, and with favorable weather conditions we should enjoy a wonderful winter wheat crop.

In addition, we anticipate for some time to come a very large in

and outbound movement from the Seminole oil fields, and, with an improvement in the condition of the oil trade, we may perhaps handle a good movement into and out of the Texas-Panhandle fields.

While it is believed there will be a nice volume of traffic, passenger revenues of railroads in the western territory will continue to be affected by the use of private automobiles and buses, which undoubtedly will cause further reduction in passenger revenues, but we are hopeful that the time will soon be reached when we can look for stabilized revenues from passenger traffic.

It is too early yet definitely to advise as to our improvement program. It will be a most substantial one, both for improving our roadway as well as our equipment. The transportation facilities of the Rock Island are in condition to handle considerable increased traffic in a most efficient and expeditious manner.

With these conditions in view, it seems that we have every reason to expect traffic prospects for the new year.

P. E. Cutting Out Grade Crossings

By D. W. Pontius,

Vice-Prest. and Gen. Mgr. Pac. Elec. Ry.

THE business outlook for next year, in my judgment, is very good for California. Many people are coming here to live; at the present time we have excellent prospects for good crops and things in general look favorable for a prosperous 1928.

The last year has been a reasonably fair year for the Pacific Electric. The outstanding accomplishments have been the cooperation between railroads and public authorities in grade crossing elimination, and the improvement of electric railway service. Three major highway grade crossings have been separated along the lines of the Pacific Electric Ry. in Southern California at a cost of approximately $450,000; four have been agreed upon and separations will soon be under way, and ten more are under consideration, which are all in the interest of the public.

D. W. Pontius

The Pacific Electric has adopted the policy of improving the type of car seats and otherwise bettering its passenger equipment. An extensive program of such improvement will be carried out during the coming year, but definite statement as to such improvements cannot be made until after the first of the year.

Just One Rain After Another Up There

By W. S. Palmer,

President, Northwestern Pacific

EXCESSIVE rainfall for the first five months of 1927 lessened the early fruit crops and interfered materially with logging and lumbering operations. Fruit crops ripened 30 to 60 days later than ordinarily, concentrating revenue from such source in September and October. The result has been material decrease in gross and net earnings in 1927 as contrasted with prior years.

As to 1928, rains this fall will prove beneficial. Lumbering interests feel encouraged, although competition with the cheaper pine lumber of the Northwest, and increased use of concrete for foundations and exterior finish are curtailing consumption of redwood.

Passenger and special excursion travel during the first seven months of the year was limited because of weather conditions. Also, such business, heretofore a material factor in the earnings of the Northwestern Pacific, owing to the picturesque character of the territory served, has been largely transferred to private automobiles. Owners of resorts in our beautifully wooded and watered sections are, however, adding materially to their facilities, and feel confident that expansion of their business will ultimately result in return of a material portion of the outing travel to the Northwestern Pacific rails.

Fruit Blocks Fast Schedule on the U. P.

By C. R. Gray

President, Union Pacific System

THE capital expenditure program of the Union Pacific for 1928 will be about the same as for this year. The only unusual item it will contain is the construction of an extension to connect the west end of the North Platte branch with the main line in the vicinity of Hillsdale, in Eastern Wyoming, a distance of about 54 miles, at a cost of about $2,400,000. This extension will provide more convenient access to the fertile North Platte Valley for coal, lumber, live stock and limestone moving in from the West.

The states in which the Union Pacific operates have had a good crop this year in practically every commodity, and we therefore look for good business, especially during the first six months of 1928. After that it will depend upon the crops, as this country is so greatly agricultural.

Freight traffic on the Union Pacific was lighter during the first seven months of this year than during the corresponding period of 1926 for the reason that there was a very small crop harvested late in 1926. However, due to good crops in 1927 the last five months are turning out very well, and will just about make up the decrease in the first seven months.

Carl R. Gray

Passenger traffic, particularly local, is still decreasing on account of the continued extensive use of automobiles.

This season the Union Pacific established passenger service, via Cedar City, to Grand Canyon National Park.

As you probably know, all trains of perishable freight on the Union Pacific are handled on a definite schedule. During the period January 1 to November 25, 1927, the Union Pacific handled through Green River and Ogden 113,602 cars of perishables, and we take pride in saying that every one of these fruit blocks was handled through to Council Bluffs on schedule.

I look for a continuation of normal business next year without any unusual changes.

Good Crop Outlook Along the Soo Line

By C. T. Jaffray,

President, M., St. P. & S. S. M. Ry.

OUR plans for 1928 are not yet definitely decided upon, but I can say that they will be fully equal to 1927, and perhaps somewhat better as we are figuring on buying some little equipment and putting in some additional rail.

The outlook in our territory for 1928 is somewhat better than a year ago because of improved crop conditions this year over 1926. The feeling is also better in the agricultural section of our territory, which I think is helping toward better times. The improved crop of 1927 very materially affected our business, so we are going to end the year with a fair return in the way of net. Considering all conditions, we are well satisfied with the results.

I cannot help but feel that this territory is constantly improving and that our adversity of the last few years due to small grain crop failures is past, the situation having changed in that every year we are becoming less and less dependent upon small grain through the constant increase in live stock and live stock products. This assures us of a steadier income and, I believe, a steadier business throughout the year.

It All Depends on the Crops This Year

By Charles Donnelly

President, Northern Pacific Ry.

Conditions in Northern Pacific territory indicate that we shall move a slightly greater volume of freight business for the first six months in 1928 than was handled in the same period in 1927, due to a comparatively good crop in the fall of 1927. The volume of business to be moved in the last six months of 1928 will depend largely on crop conditions.

The Great Western's in Fine Shape

By N. L. Howard,

President, Chicago, Great Western Ry.

THE YEAR just closed will show earnings under those of 1926 for the Great Western R. R., and in fact for a majority of the railroads in the country. This was largely due to a recession in general business which prevailed for the greater part of the year, but, due to readjustments which have been under way, it is believed an improvement will soon become manifest. Much is dependent, in this part of the country, upon the crops and it is, of course, too early to make any forecast with regard to them.

Our usual maintenance program was carried out and the property, as the year closes, is in the best physical condition in its history, and prepared to handle promptly, a larger volume of business than at any previous time. We added to our equipment, 300 box, 200 automobile, 50 coal and three passenger train cars. We are also installing 75 miles of automatic block signals.

N. L. Howard

The outstanding accomplishments for the year have been better service for our patrons and conducting operations with a greater degree of safety for our employes. Our principal shops, at Oelwein, Iowa, were operated 402 consecutive days without a reportable injury, which is a record of itself.

We plan to follow our usual program in 1928 for maintenance and improvement of the property, and are hopeful that there will be an improvement in industrial and commercial activities during all of the year, in which the railroads will share.

Certainly Does No Harm to Be Cheerful

By F. H. Alfred

Prest. & Gen. Mgr. Pere Marquette Ry

FOR several weeks now as the new year approached, indications of a promisingly good business condition for 1928, a presidential year, have become more marked. There is a general belief on the part of business men that it will be as good as 1927. There is still greater optimism extending far on into the new year, if the statements of business men and manufacturers who carry on a domestic and export trade are even one-half true. Greater importance is being attached to the reports of carloadings by the country's business men and economists every year. They maintain that in many respects it is a safer index than bank clearances, for the carloadings show the even flow of business, whereas an exceptionally big realty transaction, for instance, may at times raise the bank clearance total abnormally, and yet reflect nothing of a general interest.

In weighing conditions for the coming year, let us not underestimate the effect of the certain tax reductions that have been promised by the federal government. This has proved a factor to prod business generally in the past, and it should do it again to a lesser extent, however. While the crops were not so good as in certain years, what there was of them in the agricultural states and in the cotton growing areas, at prevailing prices, has left the farmers and cotton growers with a greater purchasing power than they enjoyed last year. The corn crop, which is a feeder crop, predicates good returns for the cattle raisers of the country for the coming year; hence more purchasing power here also. All of these conditions mean that the automobile manufacturer, the farm implement industry, the clothing and textile concerns, and even the manufacturers of luxuries, will have a wider home market. So, taken all in all, the business outlook for 1928 should exceed the accomplishments of 1927 which, after all, was no mean year, since it is now within 2 per cent of 1926, the banner year in the history of American business.

American railroads during 1928 will continue to expand their fa-

cilities as they have done every year since the war. On the Pere Marquette Railway, which represents approximately 1 per cent of the total American railroad main line mileage, this item constitutes 3.6 per cent of our total investment. This is the natural yearly expansion necessary to keep ahead of the normal industrial growth in the area our company serves. That percentage of additional capital requirements has been maintained by us for the past ten years. Our net earnings are subject to some downward modification, according to the manner the court of arbitration disposes of the wage demands that have been made upon us. Our taxes, too, for the coming year, show an upward tendency.

We are planning some extensive outlays in the event the Interstate Commerce Commission answers favorably our application for a certificate of public convenience and necessity in the case of the proposed belt line about the city of Pontiac. This entire work predicates an outlay of over $4,000,000 which should serve to buoy up business in the Michigan territory, in particular. It means that a great part of this money will go for rough railroad labor. There will be also the usual materials and supplies to be bought, and this has a similar effect upon labor conditions in other fields.

Taken all in all, 1928 should be a good year, better than the last presidential year, even if it may not come up to the total of 1926, which amounted to 51,177,962 carloads. Even so, there are no factors in the business horizon to stay business from exceeding 1926, other than political psychology.

Florida Starting All Over Again

By T. C. Powell

President, Chicago & Eastern Illinois.

THE general business, and consequently the revenues of the Chicago & Eastern Illinois Ry., were affected adversely in 1927 by reason of the prolonged coal strike, and finally by extraordinarily warm weather in November when freezing temperatures were expected. Coal movement on the C & E I as well as on some of the other roads has been very much below normal and has, therefore, reduced our gross and net earnings correspondingly.

The Mississippi River flood has a continuing effect. Thousands of acres remain uncultivated so that the buying power of the farmers is restricted, which, of course, reduces purchases in the territory served by our line. These conditions will improve as time goes on.

The Florida situation seems to be improving somewhat. As to tourist travel, and all matters connected therewith the people are starting over again. The flattening out which took place in Florida did not restrict the movement of people to that state. We are now feeling this situation in comparison with previous periods. Already we are receiving numerous inquiries for accommodations in Florida, and expect at least a 10 per cent increase over last year. In the meantime the train service has been perfected so that there is no resort section in that state without satisfactory passenger service, or which will not be served as soon as the movement begins. Most of the resort sections in Florida and the Gulf are within 24 hours of Chicago.

President Powell, C. & E. I. Ry.

The reopening of the Ford plants will have a beneficial effect upon traffic and upon industry generally.

High water in the Wabash and White River bottoms in Indiana and Illinois, while not so severe as in the Mississippi Valley, did affect the farmers of those states proportionately and very severely.

It is a hopeful sign that practically all the people in the section to which I have referred, are looking forward to improved conditions. I do not believe there is any reason for doubting the general volume of traffic for the railroads in 1928 will equal and probably exceed that of 1927. This prediction is based upon the year as a whole, but I believe it accords with the general feeling.

The C & E I has been constantly improving its tracks and facilities for the double purpose of handling economically the traffic now offered, and in order to handle effectively any increase of traffic resulting from improved business conditions.

The cost of improvements made during the year to that part of the

railway owned exclusively by the company, aggregated about $3,400,000, this in addition to the sum paid for the C. H. T. T. R. R. Co. of Chicago Heights, and to the improvements made to property used by the C & E I, but owned jointly with other companies. Included in the latter group is the track elevation project at Kensington, Ill., the gross cost of which was about $1,800,000, of which sum the C & E I paid direct $161,000, and interest charges on the remainder.

Now, if Congress Will Just be Fair

By J. M. Davis,

President, D. L. & W. R. R. Co.

A REVIEW of economic factors throughout the United States at this time justifies an optimistic expectation for business in 1928. We have the statement of the secretary of labor that relations with labor generally have never been more harmonious. Industrial and railroad inventories are very low, and money continues in plentiful supply at low rates.

The railroad outlook for 1928, I should characterize as favorable. In making this statement I am assuming that the newly convened congress, recognizing the outstanding accomplishments of the railroads in bringing themselves to their present highly efficient state in the face of serious obstacles will, in formulating its legislative program assume a temperate attitude toward the railway industry. This is essential.

Capital is a prime requisite to the development of a railroad. To earn money a railroad must be operated efficiently and economically. The accomplishment of this presents a serious problem in the face of present day ever-mounting increases in wages, taxes, etc.

J. M. Davis —U. & U. Photo

Furthermore, I am certain the general public does not begin to realize how great a financial burden is placed upon the railroads as a consequence of orders issued by public and regulatory bodies requiring large capital expenditures totally unproductive of revenue.

Capital cannot be enlisted in the railroad industry unless it is assured of a commensurate return upon its investment, and this return cannot be assured unless governing and regulatory bodies display a reasonable attitude. The importance of a fair legislative program for the railroads is therefore self-evident.

I think the most notable accomplishment in 1927, of not only the Lackawanna but of many of the railroads, has been their ability to achieve and maintain a fair percentage of operating expenses to income; in other words, operating ratio, in the face of the conditions already described. This accomplishment is in pursuance of the determination of the railway managements to give the people of the United States transportation that shall at all times be adequate to the demands made upon it at the lowest possible cost.

In this connection it should also be remembered that although American railroads pay the highest taxes and the highest wages freight rates are the lowest in the world.

Improvement of Rio Grande Continues

By J. S. Pyeatt

President, D & R G W Ry.

THE volume of traffic handled by the railroads in our territory is largely a reflection of agricultural and mining conditions. There was a crop failure in part, throughout a section of the territory we serve, the fall of 1926, added to a condition brought about by a decline in mining, manufactured and agricultural commodity prices, with a consequent temporary slackening of business activities, which caused our traffic, the second and third quarters of 1927, to be under that of the corresponding period in 1926.

The year is closing, however,

with normal business conditions in our territory. From indications discernable at this time there is every reason to believe our business in 1928 will be as good as 1927.

An outstanding event locally is the complete recovery of the live stock industry, which at this time is in better condition financially than it has been in five years.

An extensive four-year improvement program was begun by the Denver & Rio Grande Western at the beginning of 1925. This work will be carried on extensively in 1928, an expenditure of $5,600,000 having been authorized. At the end of 1928 the program will be completed at a total cost of nearly $29,000,000, on track and equipment.

The physical condition of both roadway and equipment of the D. & R. G. W. will then be fully equal to any demands that may be made upon it.

Short Lines and the Test of Courage

By Bird M. Robinson

President, American Short Line R. R. Assn.

AMONG the approximately fifteen hundred incorporated railroads in the United States, there are 800 or 900 which, because of surrounding and controlling conditions fall into a special group, and for the want of a better designation are called Short Lines. That term, when used in a limited sense, is descriptive, but when used to designate that group of roads in a broad or general sense, is a misnomer.

Conditions confronting that 800 or 900 lines are almost as numerous as the roads, hence the line of demarcation between some of the roads within that group and other roads of the more efficient class, is very indistinct. The distinction between such roads cannot be measured by the miles owned or operated, for a few roads, with very limited mileage must be classed as main or trunk lines because of their location and earnings, on the contrary a very considerable number, operating a thousand or more miles, belong in fact, to the "Short Line" group.

When asked by a member of the house interstate and foreign commerce committee, some years ago, to state some line of demarcation between the two groups, I answered somewhat facetiously, that a short line is a road that is either short in mileage or short in revenue. After years of dealing with both groups, I know of no better way of defining briefly the real difference between the two.

Bird M. Robinson

A number of roads operating very considerable mileage properly belong to the short line group, but because they earn a million or more dollars a year they are, under the commission's rules, grouped with the Class 1 carriers. That arbitrary classification of such roads is in fact a handicap rather than an honor. It imposes burdens and restrictions not really due lines that cannot render services comparable with that of other more prosperous carriers, lines that cannot pay their owners any real return and hence are a part of the short line group. The real interest of that kind of roads is practically identical with the independently operated roads that are short in mileage as well as short in revenue.

Because of the many conditions involved, it is very difficult to ascertain definitely the exact mileage of roads constituting that group. The late Senator Cummins, an accepted authority, estimated there were 70,000 miles of road that constituted the short and weak group in this country. While that probably is the maximum, the minimum may be safely fixed at 50,000 miles.

So far as I know, no careful analysis of the traffic originated and handled by all of the roads properly belonging to that group has been made, but it is probably equal to 20 per cent of the total handled by all carriers. In a recent investigation of the traffic of Class II and III roads, made by competent persons, it has been ascertained that they originate 84 per cent as much freight per mile, as do the Class I carriers. The volume of traffic handled by the latter class, is of course, very much greater for the reason that they transport not only that which they originate, but the through business originating on other lines including that of the Class II and III roads.

A substantial majority of the short line group serves territories

producing raw material, including agricultural products of all kinds, as well as the products of mills, mines, furnaces and many kinds of manufacturing plants. These lines are peculiarly susceptible to the fluctuations that occur constantly in such kinds of business.

As a result of the decline in the lumber, coal and other mining business, coupled with the general decline in other branches, the short lines, with some exceptions, have incurred rather substantial loss of revenue during 1927. However, notwithstanding the limited income, that group of roads, has, with three exceptions, all of which are short in mileage, paid the government the $7,140,000 which it has recaptured under the provisions of Section 15a of the Act to Regulate Commerce.

The officials of that group, generally speaking, expect a substantial improvement in their business in 1928.

With Good Crops There's Nothing to Fear

By L. W. Baldwin

President, Missouri Pacific Ry.

THE business outlook for 1928 in territory served by the Missouri Pacific Lines is for a far better year than was experienced in 1927. As is generally known all of the railroads with lines in the Mississippi Valley suffered more or less this year, both directly and indirectly, as a result of the great floods in the Mississippi and the tributaries of that river. In the case of the Missouri Pacific physical damage was quickly repaired and normal service restored. Potential loss, however, has been very great not only because of the actual out of pocket cost of flood damage, but also because of the reduced production in flood areas and the decreasing purchasing power in those areas.

L. W. Baldwin

This condition probably will continue until the new crops are in sight.

Barring, however, a recurrence of the floods or widespread agricultural crop failures, there is nothing to fear in 1928. Development throughout the territory served by the Missouri Pacific Lines is going on with remarkable speed. This is especially true throughout Texas.

There is a generally prosperous condition throughout the entire territory served by the Missouri Pacific with the exception of those areas directly affected by flood waters.

The Missouri Pacific should finish the year 1928 with a record proportionately better than that of 1927, just as has been the case in each of the last five years with the exception of 1927.

The Panama Canal Took Much Business

By William Sproule

President, Southern Pacific Co.

ALTHOUGH the Southern Pacific Company's gross revenues for 1927 were affected by adverse weather conditions in some sections, losses resulting from the Mississippi River floods and a slackening in industry during the last half of the year, the gross revenues for the entire year will approximate the high record earnings of 1926. Freight traffic was unusually large by reason of heavy movement of perishables from the Pacific Coast to the East which offset decreases in certain other commodities.

Any prediction respecting traffic in 1928 is made with the assumption that there will be adequate rainfall during the winter and spring so that agricultural production will meet expectations. With favorable weather and market conditions we expect to move a volume of freight traffic in 1928 about the same as that of the year just closed.

Our operations in 1927 were conducted with efficiency, and our service, both freight and passenger, has, we believe, been responsive to public requirements. The new Cascade Line in northern California and in Oregon, the new main line through Phoenix, Arizona, and the recently constructed extension into the Rio Grande Valley of Texas have provided addi-

tional facilities to the public which should aid in developing the territory served.

The work of standard gauging the Nevada - California - Oregon Railroad has been partly completed and should be in full operation in 1928.

The physical condition of Southern Pacific properties was kept up to usual high standards, and was improved by large additions to roadbed, structures and equipment. This program of improvements will be carried on during 1928 to meet public requirements and care adequately for expected traffic.

While we are fairly sanguine as to general business conditions and the amount of prospective traffic we must, with other railroads, face the fact that cost of transportation is high and has a tendency to increase while the trend of rates is downward. This means the margin between income and outgo is narrowing, causing concern as to the possibility of making capital expenditures necessary to improved service. Railway taxes, which have increased enormously, show little indication of reduction, and the wage level was materially increased during 1927 as a result of advances granted by boards of mediation and arbitration.

William Sproule

The revenues of the transcontinental railroads, including the Southern Pacific, have been curtailed because of losses of traffic incident to operation of intercoastal steamships through the Panama Canal. These water lines obtained much of the business previously handled by rail carriers, and the latter have not been permitted to put into effect tariffs that would enable them to share in the tonnage through fair competition.

These things concern the public as well as the carriers because adequate railway net revenues are essential to adequate service. The only means the roads have had of overcoming these losses has been through obtaining increased efficiency in operation. They have done this with marked success but are reaching the point where room for improvement is becoming less and less.

Law and Common Sense Are One

Here law and common sense coincide. Manifestly the train cannot stop. Manifestly the automobile can stop. A great majority of grade crossing accidents are caused either by carelessness or by downright recklessness. In either case the driver is at fault.—Easton (Pa.) Express.

Dependable Service Means Smaller Stocks

By W. J. Harahan

President, Chesapeake & Ohio

BUSINESS conditions were generally good in our territory in 1927, and I believe the coming year on the whole will be a period of substantial prosperity.

Fundamentally, our economic situation at present seems to be sound. Money is plentiful, labor is available, there is little overproduction in basic industries, and the agricultural situation is improving steadily.

That the country has come to this time in such a comparatively comfortable condition is due in no small part, in my judgment, to the highly efficient service rendered by the carriers. The speed, promptness and dependability of rail transportation has resulted in a definitely established "hand to mouth" policy of buying, and the savings in manufacture and distribution, through quicker turnover and reduced inventories has released for other purposes many millions of heretofore tied-up capital.

We have continued this year to make adequate expenditures in order to develop our present facilities up to the highest point of efficient usefulness, and we shall go forward during the coming year on the same plan of adding to and strengthening our plant so as to be able to handle business in whatever volume it may be offered us.

Our outstanding accomplishment in 1927 was taking over and operating the recently completed 63-mile line between Gregg and Valley Crossing, Ohio. This closes the gap between the Chesapeake & Ohio and its subsidiary, the Hocking Valley Ry., and gives direct all-system rails between Toledo and tidewater, and provides the shortest and most direct route between Detroit-Toledo and tidewater, the Virginia cities, points in the Carolinas and to the Southeast. Also it creates with greatly increased facilities an outlet for coal originating along the Chesapeake & Ohio through the Columbus gateway over the Hocking Valley to the Great Lakes and the rich territory beyond. Already there has been a considerable development of new traffic, due to the enlarged transportation facilities, and

I look forward to a steady and increasingly large origination of additional business.

Rate readjustments downward, decreased passenger and freight business and the rising tide of wage levels are the most disturbing signs. Changes in freight rates for the first eight months of 1927 show that the average receipts from each ton of freight carried one mile was 1.1 per cent lower than in 1926, and for every passenger transported one mile was 1.3 per cent lower. If the final returns for the year show a reduction on the same basis, this will mean that the average receipts for 1927 will be 16 per cent less per ton mile than in 1921, and 6 per cent less per passenger mile.

W. J. Harahan

The wage rates of various classes of employes have been adjusted upward. It is estimated that in this figure alone the cost to the carriers this year will be about $60,000,000.

I feel that the most constructive thing that could happen for the railroads would be to have the public realize it is of far more importance to it that the carriers should have adequate revenues for steady development and expansion than that the people should have whatever trifling savings come to them through rate readjustments. The big advantage that an adequate and efficient transportation service gives to shippers far outweighs the comparatively negligible savings in individual cases that result from rate reductions.

Service is very much like compound interest. It doesn't pay much at the start, but it certainly counts up in the long run.

Great Northern to Spend 24 Millions

By Ralph Budd

President, Great Northern Ry.

THE Great Northern will spend about $24,000,000 for additions and betterments in 1928, or about the same as for the last few years.

Northwest business conditions and prosperity depend so largely on the success of agriculture that any forecast must take yields and prices of farm products into account. Seeding is done almost wholly in the spring, so the crop outlook cannot be known until midsummer. The soil is in good condition, the past season having been above normal in precipitation, and the snowfall this winter has been heavier than usual. Traffic from products of agriculture will be heavier during the early months of 1928 than it was for the corresponding months in 1927 because there is more of the old crop to handle than there was a year ago. The crop producing area is being enlarged, and diversification is making further progress every season. Many new settlers located in Great Northern territory during 1927, and many renters have purchased farms.

Ralph Budd

Perhaps the outstanding achievement on the Great Northern in 1927 was the handling of grain during September, when 24,964 cars were moved, which is the largest number of cars of grain ever handled on this railway in one month. This traffic was taken care of without any congestion or car shortage, but this sudden movement of grain into some terminals was beyond the capacity of elevators to handle promptly, and an accumulation of grain awaiting unloading resulted. The record performance was made at Duluth and Superior, where about two million bushels were unloaded and shipped out daily for the last two weeks of September.

The building of a new tunnel 7¾ miles long, and the electrification of the line in the Cascade Mountains was carried on vigorously during 1927. This work should be completed by the end of 1928, and will practically eliminate the Cascades as an operating problem.

The new Prince of Wales Hotel constructed at Waterton Lakes Park, Alberta, Canada, was

opened July 25, 1927, and provided comfort and enjoyment to a large number of tourists during its first season.

The Great Northern is being extended from Bend, Oregon, to Klamath Falls to reach the large timber areas in southern Oregon, and it is expected that the line will be open for operation as a part of the Great Northern System early in 1928.

Looking Forward Confidently to 1928

By J. J. Pelley

President, Central of Georgia

WE PLAN to spend during 1928 slightly more than one and three-quarter million dollars for improvements and additions to our plant. Of this amount a little more than one million dollars will be for the purchase of 550 new freight cars.

Current business conditions are such as to justify our looking forward with confidence to 1928 as a good year for business. Railway traffic, although considerably below that of a year ago, is far from indicating a depression but on the contrary is symptomatic of a volume of business well above the average. In making comparisons it is well to bear in mind that business in 1926 was decidedly beyond normal, and that a recession from its levels is by no means to be interpreted as a depression. Both industry and agriculture seem to be on an essentially sound basis. In the main the farmer is receiving much better prices for his crops than he did a year ago. This increased purchasing power of agriculture can be confidently relied upon to exert a favorable influence upon general business. Greater activity in certain industries, for instance, automobile manufacturing, should result in a greater demand for railroad transportation service during the new year.

J. J. Pelley

While the Central of Georgia's traffic and its gross earnings showed considerable declines during 1927 as compared with 1926, through efficiency and economy of operation it was possible to safeguard the railroad's net earnings. The manner in which these changed conditions were met probably was the outstanding accomplishment upon our road, involving as it did not only every possible measure of economy but the loyal and efficient cooperation of all of our officers and employes.

It was a Good Year on the K. C. S.

By J. A. Edson,

President, Kansas City Southern

OUR budget is now only in preliminary shape, and will not be definitely determined until pretty well after the first of the year.

Business outlook for 1928 as affecting the railroads seems to be very promising in this section. We had a good year thus far in 1927, and expect to close in the same manner with perhaps a slight increase in gross earnings, most of which will be retained in net.

During 1927 our gross tons per train and net tons per train were the highest on record. Our miles per car per day in August, 1927, were 60.4 which is the highest record our company has made. Our ratio of expenses to gross earnings compare favorably with the lowest figure we have ever had, so that we have had a very satisfactory year as far as operation is concerned.

Crops in this section have been bountiful, and prices have remained satisfactory. We have had no labor troubles and the entire outlook for 1928 seems promising.

"The leaders in action or thought," said the late Theodore N. Vail, when president of the American Telephone & Telegraph Co., "are not magicians but steady, persistent workers."

This One Shows Earnings Over 1926

By H. M. Adams

President, Western Pacific R. R.

THE November report of the Western Pacific R.R. shows that the operating revenues during the first eleven months of 1927 increased $343,961 over the same period in 1926, notwithstanding a decrease of $169,295 in earnings upon passenger traffic.

Earnings from freight traffic increased $420,175.

Operating income decreased $1,574,439 occasioned by the heavy expenditures for rebuilding the road in accordance with the program adopted early in 1927 and still being vigorously prosecuted.

Expenditures for maintenance of equipment, and way and structures were $5,634,758, an increase over the same eleven months of 1926 of $1,182,119, which amount represents only the expenditures chargeable to operation.

In addition thereto, new money chargeable to capital account was invested in the property amounting for the eleven months to $2,548,705.

Under the improvement program announced early in 1927, the improvements necessary to put the property in prime physical condition and enable it to handle its traffic economically and efficiently there is included the renewal of rail in all main line track, the widening of embankments and ballasting, construction of new steel and concrete bridges and the rebuilding of freight cars. The following major projects were completed in 1927:

New rail was laid between Oroville and Sacramento, 65 miles, also in the Feather River Canyon east of Oroville for 25 miles.

Embankments were widened and the track fully ballasted between Wendover and Clive, Utah, 42½ miles, and embankments

H. M. Adams.

were widened west of Winnemucca for 54 miles.

The widening of the banks on the line between Oakland and Sacramento, 135 miles, will be completed during the winter months.

A new bridge, consisting of four 150-foot and two 100-foot steel truss spans on concrete piers and abutments, is being constructed across the Yuba River at Marysville and soon will be completed.

More than 1400 feet of timber trestles between Winnemucca and Wells, Nev., have been replaced with steel and concrete structures.

New passing and side tracks and extension of existing passing tracks, amounting in the aggregate to 8½ miles of new track, have been completed.

A large number of freight cars have been completely rebuilt, and the program will be carried on in the future until all equipment is in first-class condition.

New work equipment costing $475,000 was purchased so that the improvement and maintenance work can be accomplished economically, and to insure a high quality of work. This work equipment consists of:

One hundred 100,000 lb. capacity all-steel selective ballast cars by means of which ballast can be distributed evenly through a bottom dumping arrangement, between the rails, or by side dumping along either or both sides of the track.

Forty automatic air dump cars, of all-steel construction with capacity of 30 cubic yards, are also included. These cars are particularly economical and convenient for widening the embankments as the full load of any one or all of the cars can be dumped simultaneously by the simple turning of a lever.

Pneumatic tie tamping machines, which tamp the crushed rock or gravel ballast firmly and uniformly under the ties by means of compressed air, have been purchased. These machines are in units consisting of an air compressor driven by a gasoline engine, each compressor working 12 tie tamping machines or hammers over a one-half mile section of the track on either side of the compressor plant.

Specially constructed rail-laying machines, which unload the rail from the cars, remove the old rail from the track after the spikes have been pulled, and place the new rail on the ties ready for spiking, are being used.

Four switch engines have been added to the motive power equipment.

During the year the company has remodeled and enlarged the hospital at Portola for the benefit of its employes.

In San Francisco a network of tracks of girder rail construction has been laid in the industrial district bounded by Harrison, Sixth, Brannan and Ninth streets. This is a part of the plan to expand the facilities of the Western Pacific in

connection with the industrial development of the communities it serves.

An addition to the company's hotel at Wendover, Utah, required to provide accommodations for the increasing number of employes, was completed recently.

Consideration of the affairs of the Western Pacific is not complete without taking into consideration its subsidiary lines in California. It owns the Sacramento Northern, operating electric lines north of Sacramento and in the Vaca Valley; the Tidewater Southern, operating electric and steam lines south of Stockton; and interests closely identified with it own the San Francisco-Sacramento R.R., operating an electric line between Oakland and Sacramento. The total mileage of these electric lines is 364 miles. The total mileage of the Western Pacific and its allied lines within California, including the electric line mileage referred to, is 825 miles.

Jointly with the Santa Fe, the Western Pacific owns the Alameda Belt R.R., an industrial railroad in Alameda, and has a contract, subject to the approval of the Interstate Commerce Commission (for which approval an application is now pending) for the purchase of the Union Belt Ry., of Oakland, a short industrial railroad on the Oakland waterfront.

The Western Pacific and its allied interests have pending before the Interstate Commerce Commission the following applications for certificates of convenience and necessity under which it may engage in new construction, as follows:

A connection between the Western Pacific and Union Pacific at Wells, Nevada, costing $160,000

A connection between the Western Pacific and the Belt Railway of Oakland, and the Alameda Belt Railway at Alameda, at cost of approximately $500,000

An application of the Sacramento Northern Railway to build branch 16 miles in length to serve the Holland district lying south of Sacramento and west of the Sacramento River at cost of approximately $700,000

An application of the Sacramento Northern Railway to build a railroad, 7½ miles long, connecting its Vaca Valley lines with the main line of the San Francisco-Sacramento Railroad at or near Creed at a cost of approximately $375,000

The Western Pacific completed, on October 15, 1927, a branch line eight miles long, with necessary sidetracks and river terminal facilities, from Kingdon, Cal., to Terminous, San Joaquin County, Cal., at a cost of $521,000.

The Tidewater Southern completed early in the year at Modesto a terminal consisting of nine packing sheds, each 60 feet wide and 150 feet long, served by an adequate layout of tracks and roadways, with platforms and other conveniences, for the economical handling of fruits and vegetables at a cost of $135,000.

While the improvement program for 1928 has not yet been definitely determined upon, it is planned to continue the improvement of the property, the major items being the widening of banks, ballasting and the laying of new rail between Oakland and Stockton, the continuance of the rebuilding of freight car equipment and the renewal of pile bridges with steel and concrete structures. It is also expected that a large amount of improvements in terminal facilities, including those designed to facilitate the handling of freight traffic such as industrial trackage, depot facilities and team tracks, will be undertaken.

The Mystery of Rate Making

The profound mystery which the making of railroad rates assumes in the mind of the average layman was shown interestingly in an address recently by Judge M. D. Green, an attorney at Muskogee, Okla., who, after all, is scarcely an average layman.

"In making railroad rates," said Judge Green, "certain rules are attempted to be followed, so as to provide similar rates for similar kinds of traffic, regard being had to distance, competition by rail and water, density of traffic and population, cost of railroad construction, maintenance, operation, reproduction and depreciation, the signs of the Zodiac, mileage, industrial centers, the course of the Mississippi River, new territory, the Einstein theory of relativity, the Shreveport scale, the San Jose scale, due consideration being given to the rates to and from western terminals and the Pittsburg rates made with relation to the New York-Chicago adjustment, and remembering that rates from New York and Philadelphia were originally made on a basis of established differentials in excess of the Baltimore rates from Boston on the basis of differentials higher than the New York rates.

"The first step in the study of a freight rate is the step to the lunatic asylum. If the shipper knows what he has to ship, and knows where it is going from, and where he wants it to land, he takes it up with a rate expert of a railroad or traffic bureau. The rate expert throws dice to determine which page of the book he will look at. He adds all the figures on that page, multiplies the result by a bushel of corn, and subtracts a side of bacon, and tells the shipper to come back in half an hour. At the end of that time, the rate expert has received the latest opinion from the commission, and the rate is changed, and he has to begin all over again.

"It is now possible to ship trunks over trunk lines, and this rate is most easily explained. Some shippers use only specifics in making shipments, and using these north of the gateways, and local rates to the south, it is possible to go to Havana and arrive two hours before you left Broad Street station. Some people complain because the rates break in crossing the Mississippi River, not realizing the great width of that river, and not understanding why a little eastern rate cannot be stretched all the way to the Pacific Coast."

What the Electric Lines Did in 1927

By W. D. Bearce

General Electric Co.

Chicago Aurora & Elgin R. R. Four Car Train, All Cars Equipped With four G. E. 254 Motors and Type M Control.

IN THE electric railway field the activities in 1927 were concentrated mainly upon the modernization of equipment. Existing rolling stock has been replaced with cars equipped with motors and control of the latest design. In the heavy electric railway field 15 large new cars using four 140-h.p. motors and type M control have been placed in service by the Chicago, Aurora & Elgin third rail line. The Milwaukee Electric Ry. & Light Co. has replaced older motors on its suburban line with 36 modern motors rating 140 h.p. The New York Central has equipped 11 additional motor cars for its suburban service with PC control equipments and 200-h.p. motors. Important rebuilding operations on existing motor cars have been practically completed, lengthening the bodies to increase seating capacity without changing electrical equipment. For use on the Hudson and Manhattan lines the Pennsylvania Railroad has added 16 cars equipped with type M control and two 200-h.p. motors.

A number of street railway systems have extensive programs involving the use of modern light weight cars. The Eastern Massachusetts Street Ry. and the Worcester Consolidated Street Ry. have placed in service 50 new double truck cars equipped with four 35-h.p. motors and type K control. Forty similar equipments have been placed in service by the Georgia Ry. and Power Co. on the Atlanta lines and 12 equipments on the Macon lines. The Detroit Street Ry. has added 62 light weight, four-motor cars and the Twin City Rapid Transit Co., 25. Other lines in the mid west adding this type of equipment include the Gary Street Ry., the Rockford Interurban, the Milwaukee Electric Ry. & Light, and the Chicago, North Shore & Milwaukee; in the south, the Northern Texas Traction Co. and the New Orleans Public Service Co.

Trial installations of a new type car using automotive propeller shaft drive have been placed in operation on Cleveland Railways, East St. Louis & Suburban, United Railways of St. Louis, Boston Elevated Ry., Detroit Street Ry. and Montreal Tramways. These are equipped with four motors rating 35 h.p.

Many of the street railway companies supplementing rail transportation with motor buses have adopted electric drive. The principal additions to gas electric bus fleets include 50 double deck and 174 single deck buses placed in service by the Mitten Management Corpn., in Philadelphia and Buffalo, 107 by the Public Service Transportation Co. in New Jersey, and 20 buses by the Capitol District Transportation in Albany. This company is also planning to add to its equipment during the coming year, several new single deck buses seating 42 passengers. This is said to be the largest seating capacity of any single deck bus yet built. Continued repeat orders by companies using the gas electric drive indicate an appreciation of the advantages of the electric transmission.

Practically no new electrification projects have been put forward during the year among steam railroads but a number of the existing electrifications have been extended. The Chicago, Milwaukee & St. Paul which has twice previously extended its electric zone, completed the electrification this year of its entrance into Seattle a 10-mile double track line from Black River Junction. This ex-

Gas Electric Motor Car Built by American Car & Foundry Co., for United Railways of Havana Equipped With one 275 H. P. Hall-Scott G. E. Power Plant with Two G. E. 292 Motors and P. C. L. Control.

tension was placed in service without adding substations or locomotive equipment the only expense being for installation of overhead distribution and bonding.

The Paulista Railway in Brazil has made a fourth extension to its electric zone bringing the total up to 177 miles. This latest extension, which will be in service during 1928, completes the electrification of the broad gauge lines of this company between Jundiahy and Rincao. Any further electrification by this company probably will be accompanied by widening of the present narrow gauge lines. Reports by the officials continue to testify to the savings resulting from electrification.

The International General Electric Co. has supplied 24 out of a total of 38 of the locomotives now in service or under construction, six of the eight substations, and more than two-thirds of the total mileage of overhead distribution and transmission. There are now under construction at Erie three passenger locomotives which will be shipped shortly, for taking care of the additional requirements of passenger trains over the new extension.

In the United States perhaps the most interesting work on railroad electrification is that being done by the Great Northern Ry. in Washington. Electric operation between Cascade tunnel and Skykomish is to be extended through the new tunnel to Wenatchee before the end of 1928. The motor generator type locomotives, which are the largest single-phase units yet to be built, began operation in August and two more units of the same type now under construction will be shipped during 1928. These locomotives have functioned most satisfactorily. In addition to the locomotives now under construction the equipment for a second frequency changer substation at Wenatchee is being manufactured.

The New York Central is working actively on the electrification of its west side yards which will be operated from an overhead trolley north of 60th street. Below this point self propelled oil electric and storage battery units will be used, one of which has just been placed in service. This unit is a 120-ton locomotive equipped with a storage battery and a 300-h.p. oil-engine generating set for battery charging.

Equipment for the Wilmington division of the Pennsylvania Railroad including 30 single phase motor car equipments and substation switching equipment, is now being delivered. The switching equipment includes a new type of air circuit breaker with the high speed characteristics similar to those obtained for direct current installations. These new breakers have a normal rating of 1500 amperes and will be used on 11,000-volt, 25-cycle circuits. Oil circuit breakers involving the same operating principle are also to be used. The General Electric Co. is also supplying the electrical equipments for four 200-ton locomotives to be used on the New York division. The motors for these locomotives are suitable for operation on alternating or direct current.

A report issued during the year quoting one of the high officials of the Illinois Central, indicates a usual degree of satisfaction with the equipment supplied for that electrification two years ago. Preliminary figures on net operating income on the suburban service,

Sixty-Six Ton Electric Locomotive Built for the Anglo Chilean Consolidated Nitrate Corpn.

New York Central Electrification, 12 Car Multiple Unit on the Hudson Division South of Marblehill Station. All Cars Equipped With Type M Control and Two G. E. 69 Motors.

show an improvement over steam operation of more than $700,000. This improvement is accompanied by an increase in patronage which gives ample justification for the improved service.

Interest continues in the performance of the oil electric locomotive, a number of which have now been in service long enough to demonstrate the economies and other operating advantages of this type of motive power. Two 100-ton units are now in heavy switching service on the Erie Railroad and 60-ton units have been delivered during the year to the Chicago and North Western, the Union Carbide Co. and the American Rolling Mills Co.

Work is proceeding on the oil electric freight and passenger locomotives for the Putnam division of the New York Central and the 300-h.p. oil electric motor car for the same company is now in service.

Equipment for radio communication between locomotive and caboose or between train and station has been perfected during the year and is giving very satisfactory service on a locomotive operating on the main line fast freight service of the New York Central. A set has also been developed for use in classification yards for directing the operations of the various engines from the yard director's office.

As a natural result of its profit making possibilities, the gas electric car for branch line and local main line service has continued to show an increased use. Among the more interesting additions to existing equipment are the 16 cars to be placed in service during the coming year by the Chicago, Burlington & Quincy, one single unit and two double power plant equipments by the Mobile & Ohio, ten single unit power plants by the Seaboard Air Line, and three dual power plant cars by the New York Central. The Chicago, Milwaukee & St. Paul is also supplementing its fleet of G. E. gas electric cars with ten 275-h.p. modern cars. This company has also replaced the gas engines in one of the older cars with a new generating set consisting of a Foos oil engine and G. E. generator. The motor and control equipment originally supplied are retained and successful operation is reported. A single unit power plant car has been shipped to the Victorian Railways of Australia for trial on the state lines around Melbourne. Another foreign shipment includes eight cars for the United Railways of Havana. In all, about 60 of these cars have been placed in service during the year.

A new combination trolley and storage battery type of locomotive is to be used by the Chicago, North Shore & Milwaukee for yard switching. Two units each weighing 70 tons are under construction at the Erie Works. A feature of this type of locomotive is the use of a motor generator set for charging the battery when running from the trolley.

Several important programs have been initiated by railway operating companies during the year modernizing and adding to their existing power supply. One of the largest installations ever undertaken is that of the Cincinnati Street Ry. Co. which is completely overhauling its substation supply in Cincinnati. Nineteen substations are involved, a larger part of these being completely new, while a few are using the synchronous convertors in existing substations with the addition of new automatic control and supervisory equipment. The supervisory equipment is designed to permit either full automatic operation or direct control by the load dispatcher. The units controlled are of 100 and 1500-kw. capacity each. When completed, this installation will represent one of the most extensive applications of automatic control in the world.

The Sacramento Northern Railway, after several years' experience with two automatic substations is now providing automatic control for ten additional units in existing stations. These units are all induction motor generator sets, each of 400-kw. capacity.

An example of modern substation equipment for a heavy inter-

urban railway is provided by the Chicago, Aurora & Elgin, which is purchasing power from stations to be equipped by the Public Service Co. of northern Illinois. Three 1500-kw., 60-cycle synchronous converters are being used, two with automatic control and one with manual equipment. The Shreveport Railways which installed an automatic substation about three years ago, are now completing the automatic distribution for their entire system by putting in three additional 500-kw. stations, thus allowing the abandonment of the existing power plant.

Electric Roads to Climb the Pyrenees

The Pyrenees, an age-old barrier between France and Spain, soon will be climbed and pierced by an electric railroad now under construction. A connecting line is being constructed between the Midi Railroad of Southern France and the Spanish railroad system that joins Barcelona with Madrid and other important cities. Only where the Pyrenees fall off at the seaboard can railroads pass without difficult problems of engineering. More direct routes between the important cities of France and Spain have been sought and many years of study have been given to the subject.

Throughout the southern part of France runs the electrified Midi Railroad, sending branch lines to the northern edge of the Pyrenees. Likewise on the Spanish side are railroads with branches that approach the range but go no farther toward France. One of the plans which has been brought to the stage of construction is to connect Toulouse with Barcelona in a route that will be fairly direct. Farther to the west a line is being built from Pau on the Midi to Jaca that lies to the south, just over the mountains, the terminus of a branch line of a Spanish railroad.

The French part of the Pau-Jaca line will be electrified because of the numerous tunnels, the curves of approximately 650 feet radius and the almost continuous grade of 4.3 per cent. The electrification will be divided into two sections, one from Pau to Bedous, and the other from Bedous to Canfranc. The first section is already completed, but at present is operated as a steam road. There are three substations equipped with 750-kilowatt, 1575-volt direct-current sets, each set comprising two rotary converters in series.

The second section, from Bedous to Canfranc, has two substations in each of which are to be two 2000-kilowatt sets, each consisting of two rotary converters in series, built by the Compagnie Francaise Thomson-Houston, French agents of the International General Electric Co. These machines are compound excited with a special winding to allow regeneration by the locomotives. This winding, used with suitable equipment, modifies the characteristics of the machine in reverse operation and permits the regeneration of energy with but a small increase of voltage at the substation bus.

The rotaries will be capable of 50 per cent overload for two hours or 200 per cent overload for five minutes. They are very similar to those provided by the Compagnie Francaise Thomson-Houston for the electrification of the Culoz Modane line which is a section of the route from Paris across the Alps to Rome. The two substations will be fed by 3-phase, 50-cycle, 6000-volt power from the central station of the Societe d'Energie Electricque de la Valee d'Aspe.

No Street Cars Soon in New Mexico

Word came from Santa Fe, December 5, that New Mexico soon will be a state without a street car. The Las Vegas Transit Co., operating between East and West Las Vegas, filed a petition with the state corporation commission asking permission to abandon its line.

"The use of the cars has gradually decreased until a passenger thereon is almost an oddity," the petition says, adding that the cars have been operating at a loss. Permission already has been given by the two municipalities to abandon the line. The corporation commission wrote letters to the mayors of East and West Las Vegas, telling them if there is no objection the petition will be granted.

Court order has been issued for the abandonment of the street car lines in Albuquerque, a city having 25,000 population.

These are the only two cities in the state which have street car service.

Average Cash Car Fare About 7 Cents

The American Electric Railway Association announces that the average cash street car fare in cities of twenty-five thousand population or more had reached 7.9296 cents on October 1.

This is an increase of one-quarter of a cent over the average fare of September 1, 1926.

Fast Time in France

More than a mile a minute train speed is now regular schedule time for the "Sud Express" on a part of its journey from Paris to Madrid. The fast run is from Bordeaux to Dax 92 miles, on a part of the road that has been electrified.

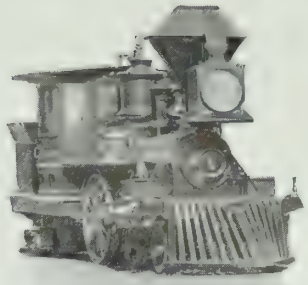
The train daily makes the run in an hour and 29 minutes, or at the rate of 62½ miles an hour.

Much higher speeds have been attained on other electrified roads in experimental runs but the Sud Express time table, recently revised, is the fastest in France.

In Chile railroad conductors clap their hands as a signal for "all aboard."

Are the scientists who say that the span of human life may yet be 100 years giving sufficient attention to the influence of the motor-car accidents in pulling down the average?—Boston Transcript.

Assign the Right Engine to the Job



This Little Old Friend Was a Wonder in Its Day, But Now—

How Economies are Effected

By H. J. Titus

FOR the convenience of study, the various items in operating expense may be classified under four general headings: maintenance of way and structures; maintenance of equipment; transportation, and general.

From an analysis of the various items, it is found that the tendency of some is to remain constant, regardless of the volume of business handled, while other items show a wide fluctuation with the business. A study of the Interstate Commerce Commission statement of railroad expenses for 1925, shows that of the total operating expenses 17.8 per cent were for maintenance of way, 27.7 per cent maintenance of equipment, 50.5 per cent conducting transportation, and 4 per cent general expense.

Further analysis shows that from 1916 to 1925 the relationship of transportation expense to the total expense shows a decreasing tendency, whereas other items show an increasing tendency. Knowing that certain items are constant, whereas others are variable, the expenses for operation in 1925 were approximated and divided between these two classes of expenditure. The total maintenance of way expense comprises 17.8 per cent of the total operating expense. Of this amount 39 per cent is variable, and 61 per cent is constant. Maintenance of equipment amounting to 27.7 per cent of the total operating expense, shows that 79 per cent of this is variable, while 21 per cent is constant. Conducting transportation amounts to 50.5 per cent of the total operating expense, with 67 per cent of a variable nature, and 33 per cent constant. General expense, amounting to 4 per cent of the total, of course, is of a constant nature. This shows that about 37.1 per cent of the operating expenses are constant, while 62.9 per cent are variable, depending, more or less, on the volume of business. These data indicate the approximate division of the operating expense. Investigation shows that the best promise of economy lies with the variable expenditures. Of these, transportation, having 67 per cent of a variable nature, offers the most promising opportunity for economy, while the maintenance of equipment expense, being 79 per cent variable, is second in importance. The direct cost of conducting transportation, which is of a variable nature, for yard and road service in 1925, constituted about 60 per cent of the total transportation costs, and 89 per cent of the variable cost. While the figures given are representative of the performance in 1925, it is found that from 1916 to 1925, approximately the same relationship existed. For road service alone, these direct expenses of transportation amount to about 45 per cent of the total expense of transportation, and 67 per cent of the variable expense as related to transportation. Therefore, to introduce economy in transportation it appears that the direct expenditures for road service should receive first attention.

There are, of course, several elements, such as power of locomotives, length of division, length and percentage of ruling grade, curvature, location and extent of facilities, such as water tanks, sidings, the class of business handled and the flow of tonnage through terminals, which must be taken into consideration. Power, we learn, must be the first consideration.

All the direct expense items except fuel, are practically constant for each train unit, regardless of size and weight. Fuel will depend to a great extent on the train load. Therefore, to obtain the greatest economy per ton mile handled, it becomes necessary to consider increasing train loads, thus decreasing the number of train units and train miles to do a given amount of work. This may be accomplished in one of two ways, or a combination thereof. Maximum grades may be reduced, thus permitting heavier train loadings, or the power of the locomotive may be increased, producing the same results. In any event, it becomes a necessity to consider the type and power of the locomotive to be assigned to this division, so as to obtain the maximum results. Also from an analysis of the direct expense, it appears that fuel and en-

Mr. Titus is transportation engineer for the Franklin Railway Supply Co. This is part of an address he delivered, December 13, before the Canadian Railway Club at Montreal.

A Rotary Plow at Work on a Stretch of Mountain Track on the Norwegian Government Railways During a Blizzard. Herbert Photos.

ginehouse costs make up a large percentage of the total direct expense. Therefore, it becomes necessary also to consider the various fuel and labor-saving devices which may be applied to a locomotive.

From a study of the maintenance of equipment expense, which is secondary to the transportation expense, it is found that this item, amounting to 27.7 per cent of the total, when subdivided between constant and variable expenditure, shows that 21 per cent is constant, while 79 per cent is of a variable nature, and will vary with the volume of business handled.

The majority of the maintenance of equipment expense in 1925 was divided among the items of maintenance of locomotives, freight cars and passenger cars. Of the total expenditures for maintenance of equipment 36.5 per cent was for locomotives, 29.5 per cent for freight cars and 7 per cent for passenger cars. During the last ten years, there was only one year in which maintenance expenditures for freight cars exceeded that for locomotives. Locomotive maintenance varied from 32 per cent to 40 per cent of the total maintenance of equipment expenditures, while freight car maintenance varied from 29 per cent to 37 per cent during the same period. For further economies the item of locomotive maintenance, bearing the greatest percentage relation to the total should receive first consideration.

In general, the tendency to increase the unit power of the locomotive, thereby making it possible to handle a greater volume of business with fewer locomotive miles, naturally reflects itself in a reduction in the maintenance expenditures for locomotives. Individually, this maintenance will depend on the class of service to which the locomotives are assigned, the physical characteristics of the road and the number and size of drivers required for the same power output.

In one instance, with several designs of locomotives operating in the same class of service over the same territory, it was found that there was a wide variation in maintenance costs. The locomotives, while of different design, were about the same age; therefore, the variation in maintenance expenditures for the different classes was not because of age, class of service or physical characteristics of the road, but because of locomotive design. This design did not include auxiliaries, such as feedwater heaters and stokers, but the Mikado class was equipped with a booster and, therefore, due allowance should be made for booster maintenance. The results showed that for a number of locomotives of each class the average maintenance cost per locomotive mile did vary with the design as follows:

Mallet type, $.52 per locomotive mile
2-10-2 type, $.48 per locomotive mile
Light Mikado type with Booster, $.27 per locomotive mile

In another instance sufficient data as to the maintenance expenditures were available for a number of two classes of locomotives. In this case the locomotives being of practically the same age were operated in a similar service over the same territory, although designed for different classes of service. The elements affecting maintenance were constant, except the element of design. One locomotive was the Pacific type, the other the Consolidation type. The average maintenance cost for Consolidation type locomotives was $.30 a locomotive mile, whereas for several Pacific type locomotives it was $.19.

Because of the variation in maintenance costs with the type of locomotive, the assignment to a particular division or class of service becomes a very vital subject, not only from a transportation expense item, but also from a maintenance of equipment point of view. Thus, before an assignment is made, a thorough study should be made as to the economic value of a particular type for the work necessary. An analysis of this character should apply to all classes of service. Each class of service is a problem in itself, and it seldom will be found that a lo-

comotive which produces economy in one service will exactly meet the requirements of another.

In assigning power to a territory for handling freight trains, several important items should be considered. Is the traffic in sufficient volume to insure that full tonnage trains may be handled with the class of power in use at present? With a more powerful locomotive, would it be possible to obtain the same relationship between the actual tonnage handled and the rated tonnage? In other words, is there sufficient tonnage available at the terminals at all times, so that it will not be necessary to run partly loaded trains?

Of secondary importance comes the physical characteristics of a division. Can maximum train loads be handled with due despatch? Are the maximum grades of great length, or are they short so they may be considered as velocity grades? Are the physical characteristics such that the maximum gross ton miles per train hour can be produced with the existing power, and can this rate of production be improved with a more powerful locomotive? With conditions which justify retaining the same power per unit, would it not be possible to obtain a more economic operation with a locomotive of different design, with supplemental power produced through the use of the locomotive booster?

On the other hand, if an increase in the power per unit is justifiable from the economic standpoint, should this increase be provided with new locomotive through the medium of increasing the number of drivers, or weight on drivers, with a consequent increase in the total weight of the power unit and cost thereof, or should it be obtained with the existing locomotive and the booster? This especially in view of the fact that the capital expenditure will be at least six or eight times greater in the case of new power. These are some of the questions which must receive consideration in procuring and assigning power to produce the most economical operation.

—International Newsreel

The Lehigh Valley Railroad Opened for Business Not Long Ago a New Pier at Jersey City for Handling Heavy Freight for Export and Delivery in New York Harbor. The New Pier is in the Tidewater Basin on the Hudson River Opposite the Lower End of Manhattan Island.

On one road data relative to individual locomotive maintenance expenditures have been obtained for several years. The class of service referred to was of the preferred type and, consequently, demanded high speeds. Originally this service was handled with a Pacific type locomotive which had ample power adequately to handle the business offered, as it came from the connecting lines. As time went on, this business expanded until the trains delivered by the connecting lines could no longer be handled in one train unit with the Pacific locomotive. If it were desirable to continue using Pacific locomotives in this service, the trains as delivered would of necessity either be divided into two trains, or double-headed. In either event, the cost of the operation would be increased. Therefore, it was decided to use locomotives of different design, with ample power to handle in one train unit the business as it came from the connecting lines. This move naturally lowered the unit cost as a whole, because of the larger tonnage per train unit. After these locomotives had been operating in this class of service for a considerable period, an analysis and comparison showed that instead of obtaining an average maintenance cost of $.19 per locomotive mile, as with the Pacific type, the cost had increased to $.30 a mile for the same operation when the Consolidation type was used. This represented an increase of 58 per cent. This discovery led to a study of local conditions. This showed that the Pacific type equipped with the booster would develop the same starting capacity as the Consolidation type, with a slight deficiency in power at 8 miles an hour. At 25 miles an hour or greater, the Pacific engine proved to be the better. The conditions which govern the loading of these engines are that they must start the train on the ruling grade, and that schedules must be maintained.

The cost of maintaining the booster, which furnishes 25 per cent of the total power, amounts to only $.005 per locomotive mile, which is almost negligible in comparison, it being merely 2.6 per cent of the cost of maintaining a Pacific type engine.

On another road the volume of

The Mikado Goes for a Trip. The Imperial Train Waiting at Tokyo for the Japanese Emperor, Under the Clock at 7:47, Going Out to See the Army Maneuvers. Underwood & Underwood Photo.

business had been increasing steadily to such an extent on one subdivision, that greater tonnage per train was brought into the terminal than could be handled over the subdivision with the power at disposal. Therefore, it was necessary to operate more train units than formerly was the case. The officials realized that a more powerful locomotive unit would make it possible to reduce the train units and, consequently, the train miles, and thus re-establish the balance between the subdivisions. In addition, greater unit power would make it possible to decrease the unit costs of operation. It developed that consideration was given to a 2-10-2 type, or the equipping of their existing Mikados with boosters.

After operating for a time the data obtained showed, when compared with the operation during a similar period when there were no boosters, that the train mile costs had increased from $1.409 to $1.456. The operation during the period with the increased power required 30,555 train miles to handle 73,432 thousand gross ton miles, while with the previous operation it had required 39,270 train miles to handle 75,426 thousand gross ton miles. Thus, while the cost per train mile was increased by 3.3 per cent, the unit cost a thousand gross ton miles was reduced from $.734 to $.605, a saving of $.129 a thousand gross ton miles. This is equivalent to a reduction of 17.6 per cent in the unit costs of operation.

These are two examples of how railroads have benefited from an economic study of the assignment of power, the one obtaining economy through the medium of decreased maintenance expense by employing the use of a different type of locomotive, while the other road found that an increase in the power per locomotive unit made it possible to decrease the direct transportation and maintenance expense of the locomotive, when considered on the unit basis of the gross ton miles handled.

What about the operation in freight service which has heavy power assigned to a division over which it is impossible to utilize over 65 per cent of the power, except occasionally, because of the local conditions and the nature of the business handled? Does this excessive power with the locomotive weights involved tend to improve the efficiency and economy of the operation? Would it not have been more economical when this road purchased this power, to have obtained a locomotive with less weight and fewer drivers, thus obtaining a locomotive which would handle approximately 100 per cent rating, and show an economy in maintenance as against the existing locomotive? This, especially in view of the fact that because of the physical characteristics of the road, the train load does not materially affect the speed of operation.

In this case the officials, of course, are counting on future business, but is it not possible that Old Man Future's stepson, Obsolescence, will run a faster race? It may be possible that when sufficient traffic is available for full train loads, the present locomotive will be obsolete. The trend in power design during the last few years proves that locomotives built only five years ago are now obsolete. It would therefore appear that a locomotive should be built for today's operation, with a slight margin for the future, but never the margin permitted with 65 per cent of the locomotive rating for the present operation.

What about the passenger service, and service in the yards and terminals? Do these types of service not justify the same study and consideration as freight service?

On a number of roads increased passenger traffic, with the steel cars now in use, has in many cases made good locomotives obsolete for main line service because of insufficient power adequately to handle the heavy trains. In these cases it has become necessary to obtain supplemental power in order, in the majority of cases, to start trains properly. The supplemental power, in some cases, was obtained through the medium of an increased number of drivers and increased weight. It would appear that in this case the same as in freight service, through a study of local conditions it might be possible to obtain an economy because of design, and let the booster give the necessary supple-

West Point on the New York Central Railroad

mental power rather than increase the number of drivers or weight on drivers.

On many roads today the yard service inherits the locomotives from road service. When more power is needed for yard locomotives the engines assigned, while more powerful and with a greater number of drivers, usually are obsolete for road service and, consequently, no longer economical. Therefore, the yard must use them until such time as depreciation permits their removal.

Is this really economy? A desirable yard engine should not only be considered from the angle of the number of cars it will handle, but also from the maintenance standpoint. Would it not be economy in this service to use a specially designed six-wheel shifter, with a booster for the necessary increased power in preference to an eight-wheel or a Consolidation type inherited from road service?

One road believes that a specially designed shifter for yard service is more economical. After a thorough analysis of their local conditions this road decided to use a six-wheel shifter because of track conditions. With the increased train loads being handled in road service, it was desirable to obtain a locomotive having sufficient power to handle the train units being brought into the terminals by the road engines. Thus it was desirable to have an eight-wheel shifter, but track structures made it undesirable. This road finally applied the booster to six-wheel switchers. Ample power to handle trains brought into the terminal was secured and it was believed it would prove the most economical because of the difference in maintenance costs and the possibility of working the locomotive to better advantage. Indications are that this engine is far superior to any other shifters on this road, showing savings in expense per car handled and in the maintenance of the locomotive.

With a class of business requiring the intensive use of a locomotive for only a short time, the investment costs per locomotive mile operated naturally will be excessively high, while on the other hand, locomotives used in constant operation show low investment costs a locomotive mile. When additional power of locomotives is justified because of the possible decrease in the direct operating expense, it would appear that a study of investment costs should be made to determine whether new locomotives costing six or eight times as much as the booster would prove more economical than existing locomotives equipped with boosters.

In the assignment of a locomotive to any class of service, several outstanding factors will have a marked bearing on the economics of the operation. With a proper relationship between the traffic and power of locomotives, it is essential that the locomotive giving the required amount of power with the smallest number of drivers be used, so that a minimum expenditure for maintenance of equipment will be required. A balance between train load and train speed must be obtained so as to have an operation giving the greatest production rate with the lowest unit cost. The required power output of the locomotive must be obtained with a minimum of investment costs.

There is a motor car for every five persons in the United States —but some have several and others none.

The Last Word in Passenger Equipment

Forty-four new pieces of latest type passenger equipment have been constructed for the Wabash Railway and have been placed in service between St. Louis, Chicago, Kansas City, Detroit, Omaha, Toledo, Buffalo and Des Moines. The new equipment, constructed by the Pullman Company, the American Car & Foundry Co. and the St. Louis Car Co. consists of dining cars, lounge cars, cafe chair, reclining chair cars, coaches and combination passenger and baggage cars. The dining cars and lounge cars are the last word in passenger equipment with roller bearings, and are luxuriously furnished.

Especial attention was given to the comfort of passengers in chair cars and coaches. The seats were designed by eminent surgeons, self-starting attachments are provided on the windows to prevent sticking, and in the chair cars there are exceptionally large smoking rooms to accommodate 15 passengers.

The dining cars are beautifully finished in light tan and gray combination with decalcomania decorations and window curtains of gray shade silk with old gold figures. The electric lighting with center lamps and candelabra side lamps as well as the fine large ceiling fans are finished in oxidized silver, and were designed especially for these cars.

The chairs are of African mahogany beautifully upholstered, and a very wide deck permits perfect ventilation. Some of the lounge cars have been put in service on the midnight trains between Kansas City and St. Louis and between St. Louis and Chicago. These lounge cars are an artistic achievement in design and decoration, the mahogany chairs and "love seats" being especially built for them.

Chinese Porters Now

Chinese aviators, Chinese diplomats and Chinese students, the Pacific Coast has had in plenty, but Chinese club car porters came into the limelight for the first time ten days ago when twelve young men of American birth, but Chinese descent, took charge of club cars on the San Francisco-Overland Limited. F. S. McGinnis, passenger traffic manager for the Southern Pacific, says club car porters must be diplomats, valets, and masters of the commissary art. To concoct refreshing drinks, satisfying sandwiches and to serve them faultlessly; to press clothes and perform other valet service acceptably; to create a favorable impression in the minds of passengers—all these are within the province of the club car porter.

The first 12 Chinese boys selected for this service were trained for their jobs under the direction of F. L. Wood, assistant general manager for the Pullman Company. All have been well educated and all were pronounced unusually fine physical specimens when examined by the company's physicians. With one exception they were born in the United States or in its island possessions.

Here is One of the New Day Coaches. You May Not Notice It. But the Seats Are Made For Human Comfort.

Two Billion a Year

The 400 manufacturing concerns comprising the Motor and Accessory Manufacturers' Association employ 200,000 persons and have an aggregated output of about two billion dollars a year.

One of the New Diners on the Wabash. Light Tan and Gray Decorations with Old Gold Figures.

One of the Wabash Railway's New Chair Cars Built by the Pullman Car & Mfg. Co.

The New Style in Lounge Cars Suggests the Reception Room in Somebody's Palace.

Editorial Comment

Good Times Assured Us Officially

HERE you have it from a trustworthy source: "Taken in a broad sense," says the department of commerce, and that's the only way to take it, "we enter the new year with the forces of stability dominant in the business world. During the past year there have been important shifts in our economic world which have an important bearing upon the future. While the average wholesale price of all commodities at about 50 per cent above pre-war is today the same as a year ago, yet if we divide them into agricultural and non-agricultural goods, it will be found that the average price of non-agricultural products has fallen in the twelve months from about 60 per cent above pre-war to 51 per cent pre-war; while the average of agricultural products at central markets has risen from about 35 per cent above pre-war to about 53 per cent above pre-war; however, prices on the farm show only a rise of from about 30 per cent above to about 39 per cent above pre-war. Manufacture and distribution have by savings and diminished profits accommodated themselves to this situation of decreasing prices without reduction in the average level of wages and therefore in the national buying power. But the great extent to which industry has accommodated itself to lower prices by decreased costs makes for a sounder condition for the ensuing year. Despite decreasing prices, production and consumption of manufactured commodities have been maintained upon a high level, as shown by car-loadings of class of goods, which have been about equal to those of last year. As to particular industries, agriculture, textiles, bituminous coal and some metals, still lag behind the others. The contracts let for future execution in the construction industries are at as high a level as at this time a year ago."

Sir Henry and the Mexican Railroads

The visit of Sir Henry Thornton and associates to Mexico on a tour of investigation has resulted in extremely important developments, if dispatches from the City of Mexico are accurate. It is estimated the monthly losses have been and still are about half a million dollars. While the Canadian committee has not made public its findings or recommendations it is reported from the capital of the republic that these will call for at least a 33 per cent reduction in personnel of the employe staff, and that full tonnage power of rolling stock be used effectively to handle traffic.

According to these figures, in 1927 there were three times as many shop employes as in the previous peak year of 1910, when the railroads were under American management. And today, there are 7000 fewer box cars in use than in 1910. The figures, relative to the number of freight cars are in 1910, 18,000, and in 1927, 11,000. There are now 125 fewer engines than in 1910.

The income for the first six months of 1927 was 55,773,089 pesos, while for the same period, last year, was 56,864,761 pesos—a decline of 1,091,672 pesos. Upkeep expenses, according to the figures, were 52,283,281 pesos for the six months of 1927, compared with 50,651,525 pesos for the corresponding period of 1926, an increase of 1,631,755 pesos. This makes the net income 2,723,428 pesos in favor of the first half of 1926.

Late reports declare the republic may sell its railroads to a group of Canadian capitalists, but this lacks confirmation.

Stepping On the Gas

Many a man kisses his family good-bye in the morning, jumps into his car, steps on the gas, and lands on the front page before night. More than 20,000 of them did it last year—up to the time the latest figures had come to hand—23,400 to be exact. That's about 2,000 a month, a pretty high price to pay in citizenship for pushing the foot down close to the floor.

It would take a fairly lively war to kill off 23,000 men, and if it occurred the women of the nation would organize and declare themselves forever and ever opposed to such conflict, and determined never in the future to produce any more "cannon fodder." Napoleon learned what women could do in this respect. When the women rose against his endless wars that was the end of Nap. Why don't the women try their hand at stopping the death toll due to fool recklessness in motor cars? The men seem rather helpless. Laws, fines, imprisonment don't appear to have much effect. There are 27 million families in this country. The women in them might be a mighty force for saving life.

Came the Dawn—

Hope never entirely dies in the hearts of the brave. Many a man, cringing humbly beneath the glare of family eyes, has gone on for years trying to cut head lettuce with a dull fork because his wife and daughter insisted it was the mark of breeding,

instead of using a sharp knife as good sense dictated. Men whose natural liking for the proprieties made it easy for them to give up the 'cello grasp of the knife and fork in cutting their meat found it embarrassing, humiliating, and exceedingly difficult to make any speed at all while this absurd rule about cutting lettuce with a fork continued in force. But not only was speed affected; it was hard on the fingers and wrist and hard on the forks. Frequently, and especially in dining cars lurching this way and that, a large section of lettuce shot across the narrow table and into the lap of some astonished woman with whom, previously, you never had associated in any way. Table covers and napkins were stained, laundry bills increased, waiters grew irritable.

But it's all over now. One of the leading authorities on such matters declares the knife is coming back into use in cutting lettuce, and moreover she expects it to stay in use. Hot cakes, however, must be cut with the fork as usual.

New Lumber Markets

Lumbermen should find some comfort in the thought that railroad cars, at least, are not likely soon to be made of concrete. Concrete has taken a lot of the old business, it is true, in the march of progress, but there are other countries, other markets calling for lumber. Palestine, for instance. The new population over there is very different from the old. Palestine now has through rail connection with Syria and the rest of Europe. Mesopotamia, that wonderful oil field, is opening up old trade routes. The Danube forests can not supply all the lumber needed, and what they do provide is not to be compared with ours if the consular reports are true. Americans are not getting into this new field, but British middlemen at Jaffa—the Joppa of the Bible—a principal lumber port, are buying American and Canadian lumber for the increasing building requirements.

Are Negro Porters Losing Their Popularity?

The sleeping car seemed intended especially as a boon for negro young men. They fitted into the job of making beds, waiting on passengers. It came as naturally to them as shining shoes on street corners. They made themselves useful in barber shops, hotels, big restaurants. But the negro is losing out. The Greeks ran him off the streets and now are doing most of the shining in this country. They aren't quite so voluble or musical as the negro but they attend strictly to business and do less arguing over trivial matters.

Until about two years ago it seemed as if the negro was secure in his Pullman work. Then, one day, appeared five or six dapper young Filipinos on a special football train running from Chicago to Champaign. Their number has been increased. They are good porters. They serve the public carefully and intelligently, and they are never impertinent.

The Southern Pacific now announces Chinese boys employed for parlor car service. It begins to look as if the humble negro would have to face keen competition.

The Lion and the Mouse

The suggestion that trucks and buses ever would be used to get passengers and freight around a washout or a wreck would have made some railroad men laugh a few years ago. The idea that a highway might be made passable for motor vehicles before bridges and tracks could be rebuilt for trains had not yet been conceived. A string of motor trucks or buses made the standpatters growl like an Airedale in the presence of cats.

But they're working together now, these two old enemies. When floodwaters destroyed many miles of the Boston & Maine tracks and tore away unnumbered bridges in November the officials of that line, led by a modern-thinking executive, started things moving toward resumption of service in a way that must have startled the formerly placid mentalities of New England. The Boston & Maine has been using trucks and buses in auxiliary service for two or three years. During the great floods those vehicles practically took the place of the railroad. Merely as one small part of the excellent service given, it is recorded that an important phase of the motor coach operations during the flood period was the service provided to replace passenger trains where it was desirable to give freight trains clear line in order to prevent any danger of congestion and industrial prostration.

Motor coaches and trucks operated between North Adams and Troy at first via Bennington, Vt., and later direct over the Hohawk Trail. The direct highway between North Adams and Troy being 10 miles shorter than the rail line, motor coaches made almost as good time as local passenger trains. The Minute Man's service was completed through the flood territory by motor coaches providing transfer between Williamstown, Mass. and Albany, N. Y. Westbound, the through passengers were delivered to the New York Central at Albany from 30 minutes to 65 minutes behind the regular schedule of the Minute Man. Eastbound through passengers from the west were quickly transferred at Albany to motor coaches, given an express run and delivered to the Minute Man at Williamstown on time one night, and on other nights from 15 minutes to 48 minutes behind the regular schedule. Eight parlor car Y type yellow coaches of the Boston & Maine Transportation Co., two parlor cars of the Albany Transit Co. and two high speed trucks covered this

passenger work between North Adams, Williamstown and Troy, handling several hundred passengers daily.

In connection with the preferred movement to delayed freight the railroad also cancelled some through passenger trains between Boston and North Adams (142 miles), Boston and Greenfield (105 miles), Boston and Fitchburg (49 miles), and some local trains between Ayer and Fitchburg (14 miles), all of which were replaced by motor coaches.

It was necessary to run doubles and triples on some bus schedules to accommodate the train passengers.

For the period from November 9 to November 15 inclusive, 1075 passenger train miles were cancelled every week day on the Fitchburg division and about 1,600 miles of motor coach service operated. From November 16 to November 21, 543 passenger train miles were taken off daily and November 22 to November 28 there was a cancellation of 420 train miles daily, practically all of which was replaced with highway service. All classes of rail tickets were honored. Hand baggage, papers and United States mail were handled on coaches. Heavy baggage and express were sent on following trains or by truck where no train service remained. Train and engine crews were isolated and connecting bus links enabled these crews to return to their home terminals and be available for other assignments. All railroad passes were honored on bus lines during this emergency.

Still another important use was found for motor coaches during the emergency. On account of so many breaks in the rail lines, train service could not be operated. In some cases to handle the large repair forces necessary, motor coaches were assigned to the maintenance of way and engineering departments for transferring their men to and from temporary camps and from washout to washout. Linemen and many miles of wire were handled on the motor coaches. These cars served as lunch wagons, taking lunches to gangs from restaurants or camps 10 to 15 miles away.

To tell the story of the trucks and their invaluable service in replacing freight trains on the Boston & Maine would take two columns of this magazine, but it would be an absorbingly interesting tale. They hauled men and supplies, timbers, rocks, food for the temporary feeding quarters; they speeded over long distances where not a train could move for two weeks or more with goods that kept industry alive when keeping it alive was about the most important thing, next to getting low water once more.

When land slides blocked the Southern Pacific lines, the middle of last month, near Santa Barbara and Redding that company turned at once to buses and trucks to handle its passengers, mail, express and freight, and they did the business. No person, and no important shipment was delayed unreasonably.

All of which shows, using only two instances for illustration, that modern railroad men are smart enough to take advantage of modern facilities. They know the people have a right to prompt service. And this is what railroads are trying to give. The lion and the mouse are good friends now.

It The Worm Turning?

The railroads—some reports say 450 of them—intend to test the validity of the Hoch-Smith resolution. This ought to be interesting news for stockholders in view of the fact that the Interstate Commerce Commission has more than once admitted that rate orders have been based at least in part on this resolution which requires the commission to consider the economic position of various industries in making rates.

Application is pending as this is written for an order enjoining the commission from enforcing its recent reduction in rates on fresh fruits from the Pacific Coast to eastern points. The railroads' action seems to indicate a determination among the executives to take a more aggressive course hereafter in protecting their resources from the attacks of interested parties. The limit seems to have been reached. As Egbert said in Ruggles of Red Gap, "You can push me just so fur and no furder."

A Few More Like This

A Rock Island train hit an automobile, one day last month, at a crossing in Nebraska. Within a few hours an attorney appeared in court to file suit, the customary and time-honored proceeding.

But the suit wasn't filed. "There's no sense to it," the judge declared. "Moreover this case was decided, before the accident occurred, by the United States Supreme Court. No sense in cluttering up the books with suits that can have only one possible ending in view of this decision."

Every day, no matter where you live, regardless of your politics or vocation in life, in almost every circumstance, some sound reason can be found for thanking the Creator. In the present instance this Nebraska judge has added much to the joy of living, and has provided one more reason why we should continue to have confidence in our courts.

The Importance of Accuracy

William Rockhill Nelson, founder of the Kansas City Star, once declared he had seldom seen anything in a newspaper, including his own, in which he was personally concerned that did not contain error. There is much truth, unfortunately, in the rather general assertion that if you see it in a newspaper—and particularly some papers—it probably isn't true, or at least it is a mistake.

Much is forgiven reporters because of the great haste with which they prepare their stories. Copy-readers, the men in the office chosen for their supposed ability to correct mistakes in the material written by reporters, can not, in a long life time, learn one-half the things they ought to know. Some of the most perfectly obvious items seem to escape them throughout their lives. It must have been a Native Son who perpetrated this one, a few mornings ago, in the Los Angeles Examiner: "Walsh, (attorney for a criminal), was found on the Southern Pacific 'Chief' at Dodge City, Kan." Either the Santa Fe or the Southern Pacific has here the foundation of a libel suit.

The Parting Guest

The Pullman Company does many interesting things. The latest was its grave announcement that among other assets it owns 2,631,646 towels. How does the Pullman Company know how many towels it owns? How can it ever know? Only one thing is certain: The company would be much more popular if it didn't mark its towels quite so blatantly.

How Can This Be Done?

Wall street does queer things, and very often. One day in December when rail stocks slumped rather unexpectedly it was attributed to that part of the President's message referring to consolidations. A rumor promptly gained circulation that in the future the Interstate Commerce Commission would pay less attention to the administration's views as to consolidations than it has in the past. How?

The Editorial of This Edition

THERE seems to be no question that among all the remarkable developments of the year just ended aviation held first place in the public attention. It presented a drama of heroic proportions, of glory and tragedy in which American youth held first place. Speed was an outstanding feature of this form of transportation in 1927 as it is certain to be in the coming year. Lieutenant A. J. Williams of the United States navy drove a plane more than 300 miles an hour. Colonel Lindbergh crossed the Atlantic at an average speed of 110 miles an hour. A hundred miles an hour in an airplane is commonplace. Fifteen miles an hour was called a sacrilege a hundred years ago.

Next to speed the goal now sought seems to be cruising radius, and in this respect the dirigible is likely to outdo the plane, as Kipling prophesied in "The Night Mail" many years ago. The British navy is building dirigibles twice the size of the Los Angeles with twice as much gas capacity; the Germans are just finishing a Zeppelin almost as large intended for passenger service between Europe and the United States; England plans regular dirigible passenger and freight service in 1928 between London and India, Egypt, South Africa, Australia and Canada. Spain is to have regular Zeppelin passenger service to South America. In the United States the navy has approved plans for what is said to be the largest dirigible in the world, three times as big as the unfortunate Shenandoah, a ship 780 feet long with gas capacity of 6,500,000 cubic feet. Dirigibles can not make the speed of airplanes, but they can travel farther and carry heavier loads. Seventy to 75 miles an hour is about their limit, and the traveling public is rapidly passing out of that era into one requiring 200 miles or more every 60 minutes. Lindbergh flew 3,600 miles without a stop on his flight to Paris; Chamberlin hopped to Germany, 4,100 miles before he was out of fuel. But the Los Angeles, with a crew of 35, can fly 6,000 miles without running out of gas, and the navy announces its newest ship will go 11,000 miles without a stop.

Such accomplishments in the air make it important for other forms of transportation to pay attention to aviation. This magazine is interested in aviation only to the extent in which it affects the business of railroads. To this extent it wishes to describe the year's developments, and these are sufficiently important to hold the attention of any intelligent reader. Among these developments, certain to have an important bearing upon the safe carrying of passengers and freight, is the perfecting of air cooled engines; light metals for airship construction; multi-engine units insuring cruising radius; inventions preventing the dreaded spin; fuels reducing fire hazard, and many other items with which science is concerning itself for the comfort and safety of humanity.

In the automotive field the principal advances seem to have been in the interest of economy in performance. Much has been done in this direction to save fuel and oil, and cars have been built to give more ease in travel, less vibration, and as a result, with longer life for the machine. There were no startling developments in the year unless one allows the designation in describing the advent of the new Ford model, and this was more a demonstration of clever advertising and its important effects than as a marvel of mechanical genius. The well-known point of saturation for automobiles seems as far away as ever, and trucks and buses are coming into increased usefulness in railroad service instead of holding the front as competitors.

In civil engineering the outstanding achievement of the year was the completion of the six-mile Moffat tunnel under James Peak in Colorado, and the Holland vehicular tunnel under the Hudson at New York. The great Carquinez Straits bridge in California with two 1,100-foot spans was finished; work

began on the Poughkeepsie and Fort Lee highway bridges across the Hudson River, while preparations were laid for the Hudson River suspension bridge at 57th street, New York, 7,000 feet between abutments, and for the Detroit-Windsor highway suspension bridge across the Detroit River, main span 1,850 feet.

In the marine field the greatest development of the year seems to have been in the use of the Diesel engine and electric drive. This is developing the fastest where maneuvering ability and luxury are required, but before the application can be general to such as merchant vessels its economy will have to be further demonstrated. During the year a number of new electric drive double-end ferries were installed on San Francisco bay. The Standard Oil Co., of California had built a Diesel electric tanker of 3200 h.p., the largest of its type until the order of the U. S. Shipping Board, which calls for the converting of three ships that are 457 feet long. The horsepower will be increased in conversion from 3,000 (steam) to 4,000 (oil-electric).

The year brought renewed activity and development to the electric roads, both in changes and in development in the interurban and street car lines. With the latter the demoralization apparent for several years, due to the traffic losses from bus competition and private automobiles, took a new turn. Non-profitable runs have been generally abandoned and buses installed to supplant them.

The most radical development, however, has been in the design of the street car. Recently, officials have awakened to the fact that street cars of obsolete design which were sufficient to compete with the horse and buggy were scarcely adequate as to speed, silence and comfort to compete with the automobile. Various new cars were built during 1927 with new motors, new drives, etc., designed primarily for silence, smoothness, light weight and higher speed. Some of these cars are quite different also in appearance, having aluminum bodies, roller bearings, sloping windshields, spring buffers, new seat designs, and gay coloring.

Probably the outstanding developments in the interurban field were the progress made in developing freight business to absorb losses in passenger revenue, the work done by some of the larger roads in highway grade crossing separations, and the general tendency to improve seating arrangements and comfort in passenger equipment.

The year will go down in steam railroad history, not as a record breaker, either as to volume of traffic handled or earnings, but as a good, healthy average, and satisfactory year, considering the limitations placed upon it by restrictive legislation, high taxes, lowering rates, and increasing wage levels. Gross revenues will be less than in 1926 or 1923 but probably will equal those of 1920.

Considering the adverse conditions, primarily the wage increases which total around $65,000,000 a year, based on advances made in the last year, the control of operating expenses is the great achievement of the year. For the first ten months the gross revenue showed a loss of about $140,000,000, but the decrease in net operating income was only about $96,000,000. In order to accomplish even this much it was necessary to decrease maintenance by $43,000,000. The per cent relationship for the first ten months of maintenance expenditures to gross was 33.4 as against 33.7 for the same period of 1926. This reduction of maintenance, while not dangerous to the properties to the extent of affecting good service at this time, is scarcely possible of repetition, in future years if traffic continues as heavy as at present, or a greater volume as is expected for 1928, either in the interest of the properties as a whole or of economical operations.

Total capital expenditures for 1927, it is estimated, will amount to about $750,000,000, a decrease of about 15 per cent from 1926 when they totaled $885,086,000. This is approximately the same as the expenditure in 1925, but much less than the peak year, 1923, when $1,059,149,000 was spent.

The car and locomotive industries were hit the hardest, there being about a 24 per cent reduction in capital expenditures for equipment, compared with 1926, reductions being about equal as between locomotives, freight and passenger cars. Expenditures for roadway and structures increased about two per cent; additional track decreased about 12 per cent while expenditures for heavier rail increased about 19 per cent. Decreases, compared with 1926, were made in capital expenditures for ballast, shops and engine houses including machinery and tools, but all other capital expenditures increased about 12 per cent over the previous year.

Probably one of the most interesting developments in the freight car industry during the year just closed was the decreasing tendency on the part of the railroads to build new freight cars in their own shops. Since 1918 when only 1,000 cars were built by the railroads in their own shops, there has been a misdirected tendency along this line. This reached a point in 1923 where 12.1 per cent, or a total of 11,611 cars were so constructed, and a peak in 1926 of 20.8 per cent, and for the first ten months of 1927 this figure dropped to 17.5 per cent. The railroads' attitude in this direction has been based largely on their belief that constructing their own cars assists in stabilizing employment, and that their costs are lower. If a proper separation of costs were developed it is doubtful whether this procedure would not be dropped entirely. Under the present accounting methods overhead and many items entering into the cost of the equipment are not shown.

The year developed many new designs in passenger equipment, leading to greater comfort and luxury, new compartment cars, new diners, new club cars, and now on many of the new de luxe trains, the sun room observation cars. But probably the outstanding development in passenger equipment was the roller bearing. The St. Paul's Pioneer Limited has been so highly advertised that everyone is familiar with it; the Rock Island and the North Western have made installations on suburban coaches, and the Southern Pacific and other roads have made installations on a few diners for test purposes.

The gas electric car for branch line service made rapid strides in 1927. The Westinghouse Electric Co. says there are now more than 250 of these cars in service and many more on order. The Canadian National Railways have had constructed a rail car with a high speed, simple light weight Diesel engine which ran, it is said, 300 miles in 300 minutes, with four stops.

While the bus and truck manufacturers are not pleased with the volume of business developing from the steam roads for these important adjuncts of the transportation machine, they are slowly taking their places in the industry, finding new uses and ultimately will reach such a volume as to satisfy even a Ford salesman. There are 60 steam roads today operating over 1,253 buses, covering 11,440 route miles and 75 roads using trucks to supplement regular shipping service. In addition to this, many roads are discovering new uses for buses and trucks in their own operations around terminals and yards for hauling materials and extra gangs.

We come now to the locomotive. In a morning paper that notorious prophet and sage, Arthur Brisbane, has discovered cheerful news for the oil men. The oil surplus won't last long because the railroads will all adopt Diesel engines, using distillate in place of steam engines. Mr. Brisbane has many problems to meet before jumping so far, but knowing nothing of these he settles the whole matter in only 13 lines less than 12 picas wide.

Simple, isn't it? On the other hand we find a statement that says: "Locomotive fuel, despite the demoralization of the coal market for months past, has cost the railroads a little more per ton than last year. With declining traffic and better fuel management, aided by cheaper oil for the railroads fortunate enough to have it accessible, the total fuel bill has been between $8,000,000 and $9,000,000 less than last year."

But that's not half the story of the achievements of the steam locomotive in 1927. It moved the tonnage faster, with longer trains and fewer units. Considerable advancement was made in developing longer locomotive runs, probably the outstanding ones being those of the Frisco. On that road this year a freight locomotive ran 2,940 miles without having its fires knocked, and regular runs of 735 without change of engine were established between Kansas City and Birmingham, and of 542 miles between St. Louis and Oklahoma City. These changes are not only reducing the unit number of engines required, but also are reducing fuel consumption and eliminating the need for intermediate shop and enginehouse facilities. The Frisco, in announcing these runs, said it expected to save almost a quarter of a million dollars a year in operating expense due to the change, and that it had reduced the enginehouse expense alone $85,000 during the first nine months of 1927. The Southern Pacific reports that by running engines through from Los Angeles to El Paso it has reduced the number of engines required for the service 50 per cent and has secured a yearly saving of $59,960.

Continuation of the success of long locomotive runs and their further development, however, will depend largely on the design and construction of the engines to be employed. They must be able to pull heavier trains, at higher speeds with greater fuel economy and ability to withstand the more severe service requirements entailed by long runs.

Old engines of obsolete design or locomotives purchased because of their low cost will never fill the bill. Only the best and newest developments of the locomotive designer's brain will produce true economy.

This fall, those of us who made the pilgrimage to Baltimore witnessed in a visible and striking way the tremendous strides made by the steam engine in the first hundred years. Mr. Brisbane must agree with us that as "the first hundred years are the hardest" the development to be expected in the future holds great possibilities.

Recently, we were complimenting one of the leading designers of locomotives on his latest creation. His reply was "Oh, that's nothing. It has just started up a new train of thoughts and ideas. Wait and see what I am going to develope now. I am hardly started."

The steam locomotive obsolete! No, sir; it's just starting! But if you want to develope the best from it speed up your traffic and reduce your operating costs. Don't do as the city council of one of the municipalities in New England did when affected by the flood in November. This council ordered the chlorine supply usually put in the water should be doubled to prevent epidemic. No expert was consulted. The councilmen didn't know the double dose did nothing but make it more unpalatable for the community already in distress. Confer with the expert; get the power that will be designed to meet most economically the operating conditions, not the power whose first cost is the lowest, or the engine which can be transferred from another service because it is available. The double dose, two for one, is likely to be the more expensive.

Congress Starts the Big Grind

Surcharge Is Threatened

By W. E. Hopkins

WITH the passing of the holiday season, congress has settled down to a grind that is expected to continue until shortly before the Republican national convention opens in San Francisco in June. What the outcome will be so far as transportation legislation is concerned is uncertain, but both the house and senate interstate commerce committees have begun activities with indications that shortly they will begin to pour proposed legislation into the hoppers of both houses.

The apparent attitude of the Interstate Commerce Commission in the matter of approving proposed consolidation and merger plans of various railroads has stimulated activity in congress of supporters of the Parker and Fess railroad consolidation bills and every effort will be made, it is understood, to bring about early enactment of railway consolidation legislation.

That the commission apparently is withholding action on the general consolidation question until congress acts was further indicated during the holidays when the commission held up, for the second time, the consolidation plans of L. F. Loree, president of the Delaware & Hudson. In a decision made public by the commission, the proposed lease by the Delaware & Hudson of the Buffalo, Rochester & Pittsburgh was declared not in the public interest and for that reason the commission refused to approve it. Linking of the two roads, according to the commission, would create the nucleus of a trunk line system extending from Boston to the West.

In order to bring about a connection between the two roads, Mr. Loree previously had presented to the commission a contract under which the Pennsylvania Railroad allowed the Delaware & Hudson trackage rights over that line from Buttonwood to Dubois, Penna., which would have permitted Mr. Loree's road to operate through trains. The commission, however, in refusing to give its permission, called attention to the fact that both the Baltimore & Ohio and the New York Central railroads opposed the lease, and added that "an additional reason for present disapproval of the proposed lease is apparent in the general problem of proper disposition of these roads incident to the grouping of lines in trunk line territory".

While the commission has not amplified its position in the matter, it is the general assumption in Washington that the commission would like to give the main eastern trunk lines an opportunity to work out a plan of consolidation in that part of the country before it takes further action. A series of conferences between the various leading railroad executives in the East have been under way for some time, but so far no indication has been given as to what progress is being made.

Appearing recently before the house interstate and foreign commerce commission, which is now conducting hearings on the Parker consolidation bill, Commissioner Henry C. Hall described the purpose of the legislation to give the public the most ablebodied transportation servants, and said "a bill should be passed and promptly passed, that will permit the commission and the carriers to go ahead and function." Commissioner Hall said the commission does not favor any one of the forms of the bill over another, but that it was his clear impression that any of the proposals would be favored by the commission in preference to the existing law.

"The matter of prime importance," Mr. Hall said, "is legislation which will permit us to go ahead, and which will include a specific grant of power to the corporations to enable them to carry out what congress authorizes to be done."

The senate committee also conducted hearings on the Fess railway consolidation bill, virtually the same witnesses appearing before it that appeared before the house committee.

Both the house and senate committees have a large number of bills affecting the railroads pending before them but for the most part they are the same as those introduced at the last session of congress. Senator Watson of Indiana, Chairman Parker of the house committee and Congressman Dennison of Illinois have introduced bills for the regulation of motor buses while Senator Gooding of Idaho has again presented his Long and Short Haul bill, and, according to a statement issued recently by him, plans to press it.

Senator Robinson of Arkansas has again offered his bill to abolish the Pullman surcharge, and also plans to take steps at an early date to secure its passage at least through the senate. Representative Hughes of West Virginia has offered a similar bill.

A bill to exempt certain short and weak roads from the provisions has been introduced by Sena-

tor Pittman of Nevada, while Congressman Newton of Minnesota has offered a similar bill in the house. Hearings on the house bill have been held, and it is the general belief that the ch
passage are exceedingly bright. The bill is being sponsored by the American Short Line Railroad Association.

Senator Smith of South Carolina has reintroduced his bill to require regional representation on the Interstate Commerce Commission, and Senator Hawes of Missouri has proposed the creation of seven regional commissions, similar to his proposal last session. A series of bills have been offered by Senator Mayfield of Texas, among them being one to amend the Interstate Commerce Act so that the commission would not have jurisdiction over constructions of extensions to railroads; to repeal Section 15a of the Transportation Act, and to add a paragraph to Paragraph 1 of Section 15 to provide that orders of state commission as to intrastate traffic shall stand and be obeyed unless found unreasonable or otherwise unlawful by the judgment of a court of competent jurisdiction.

The Texas senator also has proposed an amendment to the Constitution under which the federal power to regulate commerce would not extend to intrastate commerce, both as to passenger and freight traffic.

A large number of other bills are now pending before the house and senate committees which will never see the light of day.

The commerce committee of the senate has taken up proposed merchant marine legislation with indications that prompt action will be sought. The Jones bill offered by the chairman of that committee, Senator Jones of Washington, and which would continue government operation of merchant vessels, is expected to receive favorable consideration at the hands of the committee, and in all probability the senate as well, but there is some doubt as to the outcome of that legislation when it reaches the house and, in the event of passage there, when it reaches the White House, in view of the attitude of President Coolidge in his recent message to congress.

Caring for the Ties

As tie renewals make up our heaviest maintenance expense, we should take good care of the ties from the time they are received until removed from track. First, of course, we spot the ties in the fall, and make up the list of ties we need on each mile. We should know how many ties we need for every five poles, and unload two or three piles on every mile, being careful to unload just the number required, to avoid carrying a surplus stock of them over a year.

Ties should be stacked neatly. Two old ties should be used for the ground ties, and the pile should be "grassed" around immediately. This is a protection against fire, and would probably be beneficial also in maintaining a dryer condition around the base of the pile.

We can conserve ties, and get full service from them, by re-using on straight track where the tie conditions are "extra good," those which will not hold gauge on curves; if not fit for further use on main line, they may often be used on back tracks.

When rail is received it should be checked closely as to quantity and classification. When rail is released it should be classified as between second-hand and scrap, trucking to some convenient place for loading, and stacking it separately.

Spikes, bolts, and nut locks should be kept in tool house. Angle bars should be stacked at the tool house, and one pair kept at each mile post. Second-hand bolts and angle bars should be given a good oiling when received.

Foremen should plan their work ahead and know the exact condition of their track, and the amount of material needed. They should not delay needed work until the material gets so bad it must be taken out and replaced with new, but maintain the material in the track so it will last as long as possible, in safety, and get the fullest service from it. We must bear in mind two things in doing this: do a first-class job always, in accordance with our standards, and under no conditions allow the track to become unsafe.

Foremen on outlying sections should not carry a large stock of switch bolts, or switch material of any kind, nor a lot of extra tools. If a foreman has work to perform that requires extra tools or material that he does not have on hand, he can usually get them from the roadmaster in a few days. —Bert Swim, Section Foreman, K. C. S. Ry.

1,000 Scrambled Eggs for Two

One thousand eggs scrambled along the tracks of the Toledo, Bowling Green & Southern Interurban line near Portage, Ohio, marked the spot where a traction car came into unexpected contact one day in December with a truck driven by A. C. Hudson, Toledo.

Hudson swerved his truck to avoid hitting a woman and went onto the tracks that skirt the pavement. The car was coming from behind. Flying eggs gave Hudson his first insight into the situation.

Appeals Have Been Ignored

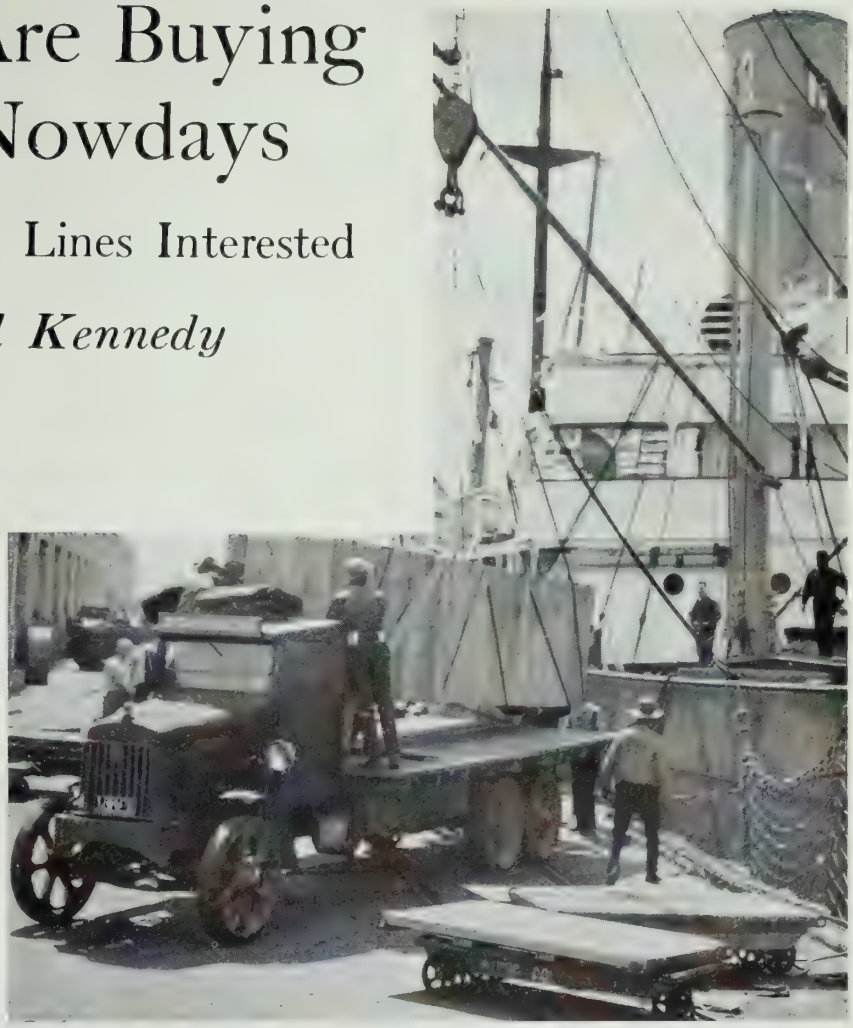
The railroads, by ingeniously designed warning signs and devices, have implored drivers of vehicles to use caution when crossing their tracks.

Accident after accident at crossings have demonstrated that the warning appeals of the railroads have often been ignored.—Elizabeth (N. J.) Journal.

Railroads Are Buying Trucks Nowdays

Steam and Electric Lines Interested

By Howard Kennedy



The Flexibility of the Modern Truck Makes it Invaluable in Moving Heavy Cargo, or, Indeed, Any Other Kind of Shipment and Thereby Saving Much Handling.

BUS AND truck makers ought to feel considerably encouraged over the prospects for 1928. Instead of the antagonism or unfriendliness which confronted them for so long in the steam railroad field they now are required only to produce the facts and the figures, ordinarily, to get the business. Some of the roads may have been a trifle slow about falling into line; there always are stand-patters in every party; and the famous—or infamous—net return influenced others to hang back. But today, in this progressive nation of ours, about 75 railroads are using trucks to supplement regular shipping service, and many others are sincerely trying to see a way to do the same thing.

Of the 75 mentioned 45 or 50 are using trucks in their terminal operations—an ideal field for this vehicle—15 in the form of store door delivery, and 11 to replace local freight trains.

A year ago today steam railways had 230 trucks operating over a route mileage of 4,226. Competing services, according to Secretary Hoover's report, had 43,207 trucks covering 607,029 route miles. The forward-looking executive knows the only way to overcome this drastic competition is to offer the same service at the same price or a little less. He knows, too, unless he is hopelessly in the backwash of public affairs, that the shipper who gives his business to a trucking company does it, nine times in ten, because he can get a direct service which the railroad can not supply, and not because he has any dislike for the railroad as such. Ordinarily, a shipper doesn't care a whoop who or what carries his goods if the rate is reasonable for the service given, and he believes they will reach destination in good order while the buyers are still young enough to use them.

Years ago, in a time within the life—and probably within the memory—of some old chaps now sitting around in the sun, railroads were denounced for being too all-fired fast. Not long ago, in the Grand Central station in New York, an old man stood looking at the first railway engine and coaches shown there. "I rode on it once with my mother when I was a little boy," said he, smiling, "She covered her face in fear, so afraid she was, because it was going 20 miles an hour."

Even so late as the Civil War the railroads were condemned for running so criminally fast—at 30 miles an hour—that many wrecks occurred and many passengers were killed. Of course, as we know now, track conditions in those days may not have warranted this 30-mile speed; but nowdays conditions and the public's mind have changed, and the road that doesn't get a lively move on its trains doesn't get the business.

So scientific and so efficient has business become that shippers now insist on cutting out all the lost motion possible to eliminate in any safe way. To this state of mind, perhaps, more than to any other influence, may be credited the popularity of the service adopted by some eastern roads with motor trucks and steel containers. With this system it is now possible to

Wide World Photo.

One of the New 72-Seater Omnibus Displays in the International Commercial Motor Show at Olympia, England, Last November.

load a container at the store or factory door, move it to the railroad and there lift it to a car, flat or box, suitably equipped for the journey to the purchaser of goods. At destination the container is removed from the car and sent to the buyer, and at least two handlings have been cut out with all the time and expense involved in such work. Leaders in this form of improved service, a year or two ago, were the New York Central and the Pennsylvania Railroad, and with their experience as a guide others followed, as was to be expected.

Speaking of the trucking service of railroads before the convention of the state railroads commissioners at Dallas, in October, President Atterbury of the Pennsylvania, said:

"We are doing new things. For instance, the railroads are developing new plans of packing in containers which can be lifted from a motor truck in one city one evening, placed in a car and moved overnight, and early the next morning taken off the railroad car and put onto another motor truck and delivered to destination promptly. This development of container transportation is very likely to revolutionize many of our methods. Ultimately it may relieve us of one of the most expensive of our activities in the handling of less-than-carload freight at transfer stations."

Sixty steam railroads, according to Secretary Hoover, have 1,253 buses in operation, covering 11,440 route-miles, while there are 19,099 buses operated in competition with railroads, the route mileage being 334,522. Electric railroads in 1927 were using 7,284 buses, compared with 5,150 the previous year. Common carrier bus route mileage increased from 232,340 in 1926 to 270,068 miles this year. The total number of buses in operation increased from 69,425 in 80,040 during the year.

Writing in the New Age, not long ago, Lloyd Underwood, an observer of long experience, said:

"Foreign visitors are amazed at the extent to which Americans move about. Let us then look ahead five years and endeavor to grasp what is going to happen, and how it will affect us in America then.

"Life and trade were localized 100 years ago; people lived and traded in communities which they rarely left. Today the scope of every business and the range of movement of every person has widened out phenomenally, and will continue to do so for years to come. Those of us who haven't traveled at least a few hundred miles, on Pullman or gypsy Ford, are objects of curiosity. We have passed through three great transportation eras. The country was canalized with much excitement about 1840, which began the first transportation period. Then it was railroadized with still more excitement about 1870, and thus began another great era in transportation. About 1910 the country was motorized and thus began the greatest and most spectacular of all eras of transportation, in the very middle of which we now are."

So rapid has been the progress in the improvement of transportation facilities of railroads, steam and electric; so many are the executives figuring on keeping up with the procession, that it is extremely doubtful, sometimes, whether the truck and bus manufacturers themselves actually know, keen as they are in their sales departments, just where their product is going. These railroad executives, as a rule, do not broadcast the fact when they begin to think about truck purchases. They like to write to others who have had experience. They look for thoroughly disinterested information. Naturally, they buy the truck whose name is familiar to them, either from personal observation or because it has been consistently advertised.

Steam railways are going after business vigorously but they intend to go after it with just as much speed in their service as modern facilities will guarantee. Electric railways and street car companies are using precisely the same methods. In this division of transportation it begins to look as if the adding of buses to the regular lines is stopping the private automobiles at the city limits. Reports read in the annual convention of the American Electric Railway Association at Cleveland, last summer, gave pretty clear evidence of this trend. Furthermore,

the reports indicated that the executives of those utilities are studying carefully everything pertaining to complementary service with buses. The reports of 52 companies, published in this magazine last month, bear out this assertion. Money is being spent in large amounts, and much more will follow it, for the best and most comfortable kind of vehicles. The public will patronize nothing else. On this point the special committee handling the subject for the electric railway men's convention said:

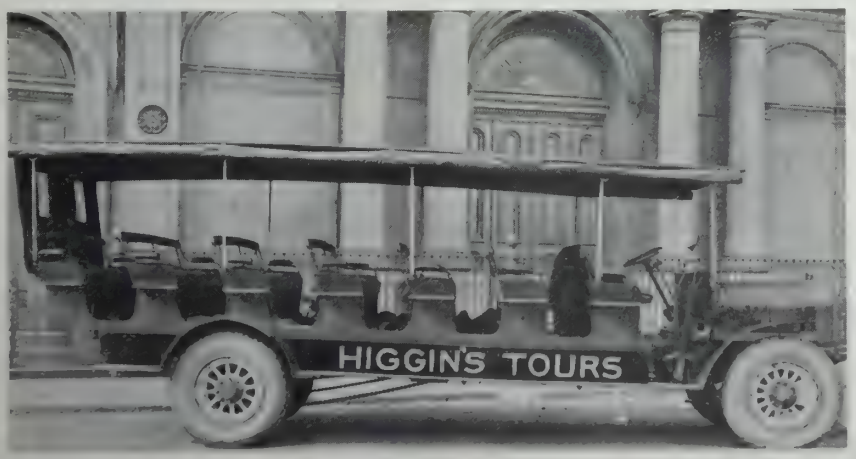
"The operating of deluxe coaches on regular routes between the high class residential and the shopping or business sections has come into prominence during the past several years. It provides a superior type of service approaching the luxury, convenience and speed of the private automobile and absence from the crowding of standing pasengers. It is operated at a fare several times higher than the street car fare and the object is to win back the patronage which the street cars lost to the private automobiles and the taxicabs. An incidental advantage is the reduction in traffic congestion in the downtown sections by keeping out the automobiles and taxicabs formerly used by the deluxe coach patrons.

"Special handling of this business usually is necessary and desirable. A special subdivision of the bus operating department for the purpose of soliciting, advertising and handling such business can be expected to show a very nice profit. Being primarily a pleasure riding business at a special charge, individual service is demanded and necessary. It can only be assured by the special attention of such a separate subdivision.

An Astonishingly Large Amount of Live Stock Traffic Formerly Handled by Railroads Now Moves Over Short Haul Territory by Motor Truck.

"Practically one-half the operating companies canvassed have selected certain types of equipment which they deem of best economy to use and use them generally in their service.

"After carefully analyzing the figures on operating expenses of sizes and makes of buses submitted by these companies, this committee is of the opinion that experience in bus operation is still too brief for accurate observation as to differentials in cost between them. While complete data was furnished for this purpose it will not be presented in this report because it was supplied this committee in confidence. However, even if these costs were not in confidence, the best effort of this committee to analyze operating cost of vehicles as a result of this investigation would still disclose that operating costs of buses depend upon local conditions, on grades and number of stops, passengers carried, schedule speed, on individual variations in maintenance and operating practices to so large an extent that for the industry as a whole a differential of cost between various sizes, types, and makes of equipment cannot be laid down. For instance, as between a 21-passenger coach and a 29-passenger coach we have submitted as a differential all the way from one cent a mile to 10 cents a mile. On this identical proposition two of the very largest operators of both types of vehicles express their opinion that the cost of operating a 29-passenger type over a 21-passenger will not exceed two cents a mile.



Old Mack Bus No. 9 Once Owned by Higgin's Tours, New Orleans. In Active Service for 23 Years; Bought Back by the Mack Co., in 1925.

Two New Features on This Bus Built For the New Company in Havana are the Seven Ventilators on the Roof and Multiple Panel Construction. The Latter Permits the Removal of Small Single Panels in Case of Damage thus Making Work Easier and Less Expensive.

"Your committee feels it is impossible to supply at this time any guide as to what vehicle should be purchased from the results of any survey of the industry."

Now Havana Adopts Buses

Buses destined for operation in tropical or semi-tropical countries require several special construction features not found in vehicles used in moderate climates. Providing these features or eliminating others calls for much thought and pre-construction redesigning, according to engineers of the Mack-International Motor Truck Corpn., who have just sent to Havana the final consignment of an order for 26 Mack city type buses purchased by the Omnibus de la Habana, a company which began operation in Havana December 1. The route now planned is between Parke Central and Playar, a distance of seven miles, for which a 30-cent fare is charged.

One of the first precautions taken in designing buses for the Cuban operation was the preparation of the all wood construction against destruction by wood-boring insects. Three coats of aluminum bronze and one coat of finishing varnish were given exposed wood parts.

Much trouble has been experienced in tropical countries with the upholstery covering of seats. Due to the heat and continual humidity, leather or fabric-covered seats do not stand up well. A special seat has been designed in which rattan is used on the seat and back and genuine leather on the sides where there is considerable strain. This eliminates the chance of garments being damaged by coloring matter in the upholstery and provides a ventilation of seats through the rattan.

To overcome excessive heat, and provide a maximum circulation of air, seven large roof ventilators were installed, one in front and three pairs spaced evenly to the rear. A departure from standard city type bus construction was practiced in finishing the roof interior. In the Cuban buses the entire inner surface has been covered with brown imitation leather to match the seats, similar to the construction of de luxe parlor car buses. This provides a double roof and an air space between which serves as insulation against heat. The transoms of the three rear windows have been hinged to swing outward, providing a direct current of air from the cowl ventilators and windshield back through the rear windows.

Flooring is 1¼ inch poplar protected all over with a coating of asphalt paint. The construction of the floor and a covering of special floor cement makes it waterproof, gas-tight and resilient. The windows are of high grade clear glass set in rubber and metal sashes. The windshield is 3-16 inch plate glass set in steel.

Lighting inside the bus is amply provided by eight dome lights controlled by switches at the left of the driver. There is also an automatic light on the step which goes on when the door is opened and off when it is shut. A safety tread covers the entire step which is a new low 12 inch type.

The main body of the bus is painted in Espania red; from the belt moulding up to the roof the color is light ivory. The narrow panels between the belt mouldings is painted blue; mouldings are black, as are the roof and fenders. The wheel discs are blue to match the belt panels and the lettering is gold.

A 29-Passenger Mack City Type Bus Built for the Omnibus de la Habana Showing the Specially Constructed Combination Rattan and Leather Covered Seats. A Comfortable, Sanitary Car.

Little Stories About Big Men

WHEN James E. Gorman, president of the Rock Island Lines, was celebrating the fiftieth anniversary of his career as a railroad man a reporter in Chicago, following the rubber-stamp formula, asked him to tell what was the secret of his success, forgetting as most reporters do, that success comes oftenest from hard work.

"I'm just common clay," said Mr. Gorman. "I'm just a plain guy who has had some good breaks. When I was catching car numbers I thought it the most interesting job in the world. That was my job, and I thought it was a great job."

"And now you're a railroad president," said the keen reporter.

"And now, being a railroad president," Mr. Gorman admitted, "is the most interesting thing in the world," and he looked at his interviewer out of a pair of steady blue eyes.

"I'm supposed to be a bad egg," he continued. "I have to keep up a front. It won't do for me to be saying I like to make friends with everybody, or that I want everybody to think of me as a pretty good fellow who would do them a good turn and expect them to do him a good turn. I'm supposed to be a tough guy."

It has often been said that while railroad presidents do not, as a rule, come frequently into direct contact with their employes their personal popularity among the men, the belief that they can trust him to see they get a square deal, is one of a road's most important assets. Particularly is this true if, as often happens, the big boss came up through the ranks, instead of falling into his job through some outside influence, such as bankers, for instance.

Few Railroad Presidents Ever See the Bottom of the Stack of Papers on Their Desks. "Like Shoveling Sand," President Gorman Once Said. "No Matter What you Remove More Comes In."

Of course, it is pretty well known as a matter of cold business common sense, that no president is likely to be very long in charge of a great property worth hundreds of millions if the bankers don't think he is about right. Bankers don't own the railroads, as the records prove, but they do have a whale of a lot to say about who shall own them, not overlooking the important business of getting the interest on the bonded indebtedness, a subject not lightly to be considered.

Men with money to invest, and women and estates do not put cash into railroad stocks or bonds, usually, without talking to their bankers about it. What the banker says about a railroad is pretty certain to have much to do with the success or failure of a stock issue. If a man—or a woman—decides to invest in an oil well certain to pay 235 per cent interest, or an especially rich gold mine on the coast of Labrador, the banker may not get a chance to give up any advice, but when it comes to railroad stocks and bonds he is the boy who has a hammer ready if everything isn't running to suit him.

The two sides of the story dovetail into each other inevitably: If a president stands well with the men, if he is known to be a human being who has had hard knocks on the way up, he is rather likely to stand well with the bankers, for the simple reason that men who like their chief are going to be loyal to him, and loyal men do good work; good work will produce good results, and these results are what pleases the frosty-faced gent at the bank who lends money for high prices and calls it an "accommodation," for some reason which, to this writer at least, always has been a deep and solemn mystery. Occasionally, of course, it does prove unexpectedly to have been an accommodation, but that is something for the receivers to settle.

The widespread idea that railroad presidents are exclusive or aristocratic is all baloney—and that's the way to spell the word in this usage. If it proves difficult or impossible to crash into an executive's private office at any old hour the reason is that the man's time is too valuable to be used listening to talk which would be just as profitable and interesting if directed down a rain-spout. Until you have risen to high position and power in business you will never know how many paranoiacs are roaming around loose in this world trying to use up the time of busy men. They are the human flat-wheels of life, making much noise, disturbing people wherever they go and producing nothing.

To the person who trembles before a throne or a mahogany desk the idea of calling a railroad president by his first name is incredible, and little less than a capital offense. But the president

smiles when he hears of it—if he's the right kind of president. Naturally, and very properly, he wouldn't approve an employe's slapping him on the back or calling him old top to his face. Such familiarity would be subversive of discipline; and anyway such things aren't done. It is easily possible to be loyal to a man and admire him sincerely without putting your arms around him or giving him a French salute. Osculatory demonstrations are not good form in railroad circles.

One of the most human railroad presidents in this country today is James E. Gorman of the Rock Island Lines. In his interesting career he has lived the entire gamut of labor. He rose to the presidency out of the freight traffic department, and those who ought to know do not hesitate to say he is one of the greatest getters of business in the industry. He knows life thoroughly, and if you doubt it you have only to read a letter written by him to some chap who needed counsel—and such men are after him constantly. To thousands whom he has never seen he is Jimmy Gorman, a sound reason for pride after 50 years experience as a railroader. No one ever fears to go to him for help whether it's a discharged brakeman, conductor, track man looking for another chance, a preacher or priest, a fact that has cost him many hours in time and goodness only knows how much in money. They may have had to wait a long time before getting into the office, for the reception room is always crowded, but once inside they are kept there until the problem has been solved. And that's some satisfaction.

Mr. Gorman is optimistic constitutionally and he imparts it to others. Still, it must be admitted, he is a mystery to some men who have known him many years. Some of these who delight to call him Jimmy behind his back are amazed, some times, to discover that the Rock Island's executive knew all about the line of hokum they were handing out in his office. The twinkle around his eyes doesn't mean a thing except that he has enjoyed the interview, taken what he believed to be the right course, and hasn't been fooled for a moment. Men's motives are pretty well understood by this railroad president, and he has a perfectly uncanny way of detecting the false. He has a keen appreciation of the value of publicity for his road, but never seeks it for himself. What he believes the public has a right to know he tells it. What he thinks is the private business of himself and his company couldn't be pried out of him, with a—whatever it is people use for prying things loose. He is affable but firm.

Samuel M. Vauclain Standing Near the Shelter on the Top of Pike's Peak.

Speaking of letters to troubled men. One day, several years ago, an appeal came to Mr. Gorman from a convict in a far western penitentiary. Naturally he wanted to get out. Also he was innocent, but had never had a chance to prove it, and someone had told him Mr. Gorman could and would help him.

The appeal made a strong impression upon Mr. Gorman, but he determined it would be necessary to investigate carefully before committing himself. The convict's letters were wonders of detailed explanation. Mr. Gorman's replies, philosophical, sympathetic, encouraging, were rare examples of epistolary literature. The conductor of this department who read them in the carbon state has never seen anything just like them. They were worth going to the pen to get, and if the convict wasn't released without serving his sentence, which is not a matter of particular interest in this chronicle, he must at least have had a joyous time reading them. They were comforting letters, the kind that fathers should write to their boys in jail or out of it, letters impossible for a man who had not been through the university of hard knocks which confers its degrees late in life.

Mr. Gorman was born in December, 1863, at Chicago, and started his railroad career on the Burlington in 1877. In the intervening years he has worked on several railroads, the Santa Fe and the Illinois Central among them. Fifty years he has been at it, a long time to stick at anything, but not much in his life because he likes his job. He has been and still is a hard worker, but you would never suspect it. He is a young man today. He likes to play golf, but the rule, "Keep your eye on the ball" bothers him. It isn't as easy to do as it was years ago, for reasons which are entirely personal.

But He Went to Philadelphia Eventually

If it hadn't been for a considerate Catholic priest, it is very likely that Philadelphia where, a long time afterward, he worked out his great success in the world of locomotives, might have been the birthplace of Samuel M. Vauclain. It just happened, however, that the family of which, after a while, he was to be a member, moved to Port Richmond. There wasn't an empty house in the town.

For a while it looked as if the family would have to go to the Quaker metropolis, not far away.

"Well," said the priest, "I have a big house, and a few rooms to spare, I'll rent you a couple."

The father, glad to find a haven for himself and family, moved in, and there Sam was born. Eventually the father found work with the Pennsylvania Railroad at Altoona, that road having recently completed its lines across the Allegheny Mountains.

The first really human interest event, after the birth of the boy, was described by Mr. Vauclain one evening, talking to the Engineering Council of Colorado at Boulder on Engineers' day. A brother in the navy had come home with a lot of old white duck uniforms, and out of one of these a suit was made for the boy. This is where the trouble begins.

"Father and mother were proud of me with my new suit and shoes —bronze toes—and father decided he would take me for a walk. Mother agreed, but warned him to keep away from the round house. Of course that is just where we went finally. An engine was ready to go up the mountain. It had steam up and was about to start, when the engineer saw us, came over to father and began to growl about a new apparatus for squirting water in the boiler, which had just been installed on the engine. He vowed he would take no chance of running out of water going up the hill without a pump.

"Father said he would take the engine up the hill to show him how, so he put me and my immaculate white suit on the engine and away we went. We made the hill all right and we didn't run out of water, but when we got back, father took one look at me and exclaimed, 'My God! Come on.' He washed my face in the office and we started for home. Mother met us at the gate and said not a word, but I never had another white suit.

"My early training was in the locomotive shops. From the time I wore dresses I was apprenticed to the locomotive business, and so was the constant companion of my father. We had some difficult times in those days. Engineers and firemen were hard to get and when the Civil War started, often refused to comply with orders, for

And This is Mr. Vauclain Convalescing After His Journey to the Top of Pike's Peak.

they were disposed to handle matters as they pleased.

"One day I was down by the oil house. You know where the oil house is. It is where everything is settled. I remember a pile of logs between the tracks, and a tall man with a double barrel shot gun standing on those logs giving an interesting talk of the things he was going to do. For one, he was going to the round house to blow the foreman's head off. About that time a little woman came around the corner and without a word, pointed her finger up the street toward the town. The tall man lowered his shot gun and walked away with the little woman after him. That was the first strike I was ever in, and I there learned there was nothing in a strike to fear. The little woman was my mother, the fellow who was to have his head shot off was my father, and the fellow who proposed the shooting was my uncle. All in the family."

Sam had a lot of trouble at school. The boys insisted he should show up barefooted and his mother said he had to wear shoes. Many a boy has had this tragedy to work out for himself. Sam fixed it up right and pleased both sides. He started to school every morning properly shod according to his mother's viewpoint, but part way there he took off his shoes and stockings and hid them under the wooden walk. At school he was admitted to the sacred inner circle barefooted. On the way home at night he put on his shoes. You have to do tactful things like this all through life, harmless little deceptions that mean peace to some folk.

Sam Vauclain was a queer kid. He liked to get up early! Worse still he was fond of work. This is no Horatio Alger story but such things have to be told when you are writing biography and they are facts. This boy actually liked work. He learned to do a lot of things too. He could dig wells, he could put on lath and plaster, he could rough coat, stain coat and skim coat and he used to do these things before and after school!

He didn't get far in high school. His father had to put him to the serious business of earning his living. He would have gone into the navy if his father hadn't objected. One son in the navy was enough, he declared, and sent young Sam over to the shops to become an apprentice.

He started at 50 cents a day at 16 and a year later he was still earning 50 cents. Finally he was apprenticed to serve four years with a promise of $124 bonus at the end if his conduct was good. He was six feet tall by this time and weighed 180 pounds, some whale of a boy.

One day he was transferred to a little lathe weighing about 100 pounds. "I looked at that little thing," said Mr. Vauclain, "and I looked at the foreman, disgusted. There was about a wagon load of bolts to be turned in that particular lathe. Another boy assigned to a similar job was about to give

it up, but finally we got together and I said, 'Look here! We'll never turn these bolts by looking at them. I'll help you and you can help me, and we won't say a thing until we finish this work.' With that spirit, we finished the bolts.

"I was then transferred to the vise department. Everything in that department was held in a vise —in fact vice of any kind seems to have that peculiar quality of holding on. The old foreman said to me, 'Well, what can you do?' I answered, 'Well, I ought to be able to do something.' 'All right, come on!' he said, and took me to the other end of the room. Now the most hated job in the shop was cleaning and repairing pumps. There were always several to be done, and the old foreman always tried the newcomers out on such work. It usually took three days to do a pump. Well, I started and in half a day I had the pump finished, so I folded my arms and stood up against the vise bench. The old foreman soon came along; he looked at me and said, 'Don't you want to work? Where's the pump?' I said, 'There it is.' He looked it over, then looked at me and said, 'Good! Try another one!' I said, 'Thank you.' When that was finished, he said, 'Well, I guess you know all about pumps; I'll give you something else.'

"He took me to another part of the department where a laboring man came down with a pair of old locomotive connecting rod straps, and set me to work cutting keyways. The old laborer kept on bringing down straps until I was nearly buried in them, and I said to him, 'Got any more?' And he said, 'We have some more.' Well, I kept on working. I did the first one in about three and one-half hours and the next one in about three and a quarter, and the next one in about three. A few days later, the foreman stopped at my bench, looked at his time book and said, 'Do you think you'll live long enough to get that strap done?' I said, 'I don't know. There are the straps I've already done.' And he said, 'Great Scott! That's enough straps. I only meant for you to do the first two,' and I got out of that job.

"The next job was the best in the shops. The foreman ordered in a pair of fluted rods and said, 'That was a very nice job you did on the straps. Make a nice job out of these.' I had no sooner gone to work on the rods than some fellow came over and said, 'Who put these rods here?' I said. 'That old Dutchman.' And he said, 'Well, he made a mistake,' so he took them over to his bench. I folded my arms and leaned up against the bench, so pretty soon the foreman saw me and said, 'Why don't you work? Where are the rods?' I answered, 'The fellow over there with the red whiskers took them.' The rods came back and as soon as I resumed work, the red whiskered fellow came over and said, 'Look here! It takes me 16 days to do those rods. You can't finish them in less than four weeks and do them right.' I said, 'Thank you!' At the end of the fourth day the rods were finished and ready for the engine.

"I do not know whether I was doing too much work or not. I never thought much of it at the time, as my thoughts were mostly centered on college; for I was planning to go to college just as soon as I could scrape the money together. I studied up every engineering problem I could find. The apprentice's library was a great help to me, and I spent considerable time there.

"To make a long story short, I ultimately became free, and was made assistant foreman temporarily. The idea of a boy 21 years of age being assistant foreman in a large railroad shop was a novelty. But, as I said, I was finally free and I was given my $124. I took it home and nailed it down in the bottom of my trunk and said, 'Stay there!' I knew as long as I had that $124 I was rich. Right then I made it my policy to keep so busy that I would not have time to spend all my money.

"One time when on a train going home, I kept thinking of my college education and I said to myself, 'See here, young fellow, why wouldn't it be better for you to keep on with your work and go to night school than to quit work and go to college? At the present rate of promotion it would be a lot better for you.' I pondered on it quite a while and finally decided to continue at work. The foreman gave me 18 cents an hour. He also gave me a large 36 inch lathe to run. One of the worst jobs in the shop was that of turning out piston rods. At the piece work rates paid, no one had ever made a living turning piston rods. There was 150 rods to do, and the foreman gave me all of them at 63 cents a piece. So I started on the piston rod job, and was able to do the first one in a little over an hour; then I cut the time to an hour and then to 50 minutes, and then to 45 and, in time, I was through with them. The foreman had lost money by paying me piece work and reported that I was hogging the job.

"For three long weary days, I was without a job. Finally, I was told to report to the office and the foreman came over and said, 'I told you you'd get fired. Why don't you behave yourself?' Well, after I was in the office for two or three hours, the foreman of the machine shops said to his assistant, 'I'm going away for a month. You run the shops and Sam will be the assistant and take care of your work until I get back.' Before the boss got back, the master mechanic offered me the choice of two jobs. He said, 'This first job will pay $150 a month and the other job is in the frame department. 'I said, 'What does that job pay?' He said, 'That pays 21 cents an hour. Hard crowd down there. Nobody can handle them.' I said, 'That's a good job. I'll

take it!' It was a job with small pay, only $8.40 a week, but I had a chance to learn—to learn to handle difficult labor. Well, I went down to handle the 'hard crowd' and they thought I was their friend, and I was, and I sympathized with them and made them work hard enough to forget that 'nobody could handle them.' "

Then what did the young man do but get married—on $8.40 a week! It took courage for both of them. Not long afterward he went to Philadelphia to supervise the building of 60 locomotives at the Baldwin Locomotive Works at $3 a day. He did the work, saved a little money, got a start in the world. Soon as general superintendent he was making $4,000 a year. The Rogers Locomotive Co., offered him $10,000 but he turned it down. He determined to stick to his job and "make the best locomotives in the world," which comes perilously close to free advertising in a biographical sketch.

Next he was offered and accepted a contract for three years at a higher salary, wouldn't take anything for his patents of which there were several, and ultimately became a member of the firm—became senior vice president, went to Russia when the World War broke out, dug up much good business and got the money for it; built a rifle factory, a building covering 37 acres of floor space, 10,000 tons of structural steel, did it in four months, and later turned out 7000 rifles every day for the United States.

"The Armistice" said he, "found me sitting on a wharf in New York waiting to sail to France to promote the making of fighting tanks. An officer came to me and said, 'You can't go abroad.' I said, 'What have I done?' He said, 'You're wanted in Washington.' So after a conference in Washington I came back to the Baldwin Locomotive Works and later, as president of that company, have exerted every effort to build up its business. We have agents throughout the world and we now have orders coming from every country in the world. The only way you can get money is to work for it. We wanted money, and so we have worked hard for it."

And this, with many thrills left out, but with years of hard work left in, is the story of Sam Vauclain. "I was born without a shirt to my back," he said, beginning the story. "But, for that matter, so were all the rest of us."

Another Motor Car Attacks a Train

Ben Wetherholt, a retired farmer living near Clements, Kan., was trying out a new car the other day. As many another man has done, Mr. Wetherholt approached a Santa Fe railroad crossing. Up the track, not far away, a passenger train was coming at high speed. It angered the retired farmer to see a train trying to beat him to the crossing so he stepped on the gas, if the reports and the results coincide. The motor car struck the first coach back of the engine at about 40 miles an hour, and broke off one of the company's steps. The impact made the car rebound but failed to discourage the driver apparently, because he charged a second time and struck another coach and damaged more steps. About this time the engineer decided doubtless that discretion was the better part of valor, as the copybooks used to say, and stepped on the steam, or whatever it is the engineer does when he wishes to escape an angry motorist. Before the car could attack again the Santa Fe train had escaped. Damage to the motor car consisted of a flat tire and bent fenders and radiator. Peter Schimpf, riding with Wetherholt, was slightly bruised and both men were unnerved by their thrilling experience.

They Might Have Known It Would Fail

Golf, frequently blamed for financial troubles in homes, has been charged with financially embarrassing a railroad.

The North Shore & Western constructed three miles of track in Evanston, a suburb, to a golf course several years ago. It was subsidized by golfers.

Now the line has asked the Illinois commerce commission to reduce its taxes because of lack of patronage due to use of automobiles.

A Vested Right

The public has no right to demand a duplication of transportation when the effect of such duplication is to cause one form of that transportation to be operated at a loss. And therein lies one of the vested rights of the steam railroads in transportation, merely a vested right not to have its property taken away. And, therefore, the choice should be made in those cases where the railroads cannot enter the bus or truck business.

There cannot be both forms. The public, I believe, will come to the point where it will make its choice and abide by that choice and then the carriers may determine whether or not to let the bus go on, or to seek to operate that bus as the public wants it operated.

It is a well established rule which was debated but a few years ago that any loss of revenue in the passenger business of a railroad may be and must be recouped from increased freight revenues. Therefore the public should be made to know that if it wants to have a railroad service such as it has heretofore experienced, it must be prepared to support that service by an increase of revenues from some source and if it fails in the passengers' side it must be recouped from the freight side. —R. N. Van Doren, vice president and general counsel, Chicago & North Western Ry.

What the Papers Say

THE progress of our country has almost exactly kept abreast of transportation. In the relatively short space of a hundred years, we have increased our national wealth from nothing worth mentioning to 350 billion dollars, and our population tenfold. From a few thousand miles of miserable post-roads we have expanded until we now have 250,900 miles of main line track. With only 8 per cent of the world's area and only 6 per cent of its population, we have more than one-third of the world's railroad mileage.

Although motor trucks, stages and airplanes now play an important part in our transportation, it seems certain that the railroad will survive to celebrate its second centennial.—Seattle Times.

The Railroad Pioneers

Railroads were bold ventures in the beginning. Men pinned their faith to these costly enterprises before anyone could be sure that they would become the indispensable arteries of trade and travel which they afterward did become. Wildernesses were penetrated and subdued by the railroading pioneers.

Without the vision and the practical aid of those audacious spirits, it is inconceivable that this vast nation could have been knit together with political and social and economic ties as it is today.—Boston Traveler.

U. S. Railroads Lead the World

American railroads are easy leaders in the transportation facilities and luxuries furnished in all the world. The managers of these railways have long demonstrated their ability to do tremendously big things well.

Secretary Hoover, in an address recently, pointed out that American railways, under private management, have given new proof to the world that they can do better than when under federal control.

The figures stated by the secretary are such as to show that American railway managers know how to get results. They are the best railway men on the globe.—Youngstown (O.) Telegram.

Carelessness Is Unreasonable and Costly

The ordinary man who considers himself reasonable would be compelled to admit that he has sometimes been negligent in safeguarding himself in the manner which the Supreme Court says is obligatory. Most of us are careless. The standard of conduct laid down by our Supreme Court is a high standard; but it is reasonable. It is our carelessness which is unreasonable.—Chicago Journal of Commerce.

Greater Care and Caution Are Needed

Railroads have done much in recent years to make grade crossings as safe as possible and to establish warning signs of various kinds. Efforts on the part of highway safety organizations and the press have been to influence cities, villages, counties and states to eliminate grade crossings wherever possible. In spite of such campaigns, the number of grade crossings is huge and the danger will not be lessened without greater care and caution on the part of the public. The decision placing responsibility on the individual will do much to make the public more careful.—Oshkosh Northwestern.

Stop, Look and Listen and Live

The decision of the highest court in the nation absolves railroads of legal responsibility for grade crossing accidents and places the whole burden of responsibility upon those who fail to protect their lives by not only stopping at crossings but by doing much looking and a great deal of listening.—Lynn (Mass.) Telegram News.

At Your Own Risk

If you walk or drive upon a grade crossing you do it entirely at your own risk. The railroad is not responsible for your safety. . . . Under this decision the rule, Stop, Look, Listen, takes on still more importance. The court also adds, in effect, get out and look if you are not certain of the location of the train.—Rockford (Ill.) Register Gazette.

Upon the Individual

Every railroad crossing of a highway at grade is an established right of way for the railroad trains, a condition of which every person using the highway, pedestrian or driver, should take cognizance. It is the proper duty of the railroad to mark the crossing so that even the stranger along the highway shall be aware of its presence; it is also a reasonable requirement that the railroad shall give warning of the approach of a train. But the responsibility of "due care" rests upon the individual on the highway. If accident shall occur through his negligence, he cannot blame the railroad.—Zanesville (Ohio) Times.

A Fool and His Car

It may be said that logically it should not be necessary to argue with any man not to take risks at a crossing. But it may not be amiss to emphasize the fact that the Supreme Court of the United States has declared that a man in a car who fools with a train at a crossing is a fool, indeed.—Baltimore Sun.

Airships A Factor in the Future

Railroads Should Study Advance

By H. F. Guggenheim

Prest., Daniel Guggenheim Fund

I HAVE made a comparison of the mileage by railroad and the mileage by air between some of the principal points in the United States. This study indicates that by air route there is a saving of approximately 10 per cent over the tortuous route of the railroad. An analysis of this sort, I realize, is open to criticism, but it indicates the possibilities of materially shortening the distance between two given cities by air travel.

Although the present average speed of the airplane has been given as 90 miles an hour, the possibilities for the future are beyond safe prediction. Even while we are discussing this subject here, the speed is being increased an additional 30 miles an hour for commercial work. Within the next few months an air passenger service will begin between Los Angeles and San Francisco. The cruising speed of the airplanes will be 120 miles an hour. As you all know, man has already flown at a speed of over 300 miles an hour. Although it seems fantastic to us to conceive of traveling commercially at that speed today, nevertheless, the history of the past and especially the history of aviation is evidence that the fantastic of today becomes the commonplace of tomorrow.

After speed, the second factor is safety and this will govern the acceptance of the airplane. In the past public support has been withheld largely for two reasons.

In the first place man has a traditional dread of using an unaccustomed medium. The fear of air flight is similar to the dread held by the ancients of sailing on the sea. This traditional dread is fast disappearing, and I think it fair to say from observation, that the children of today have not the slightest fear of air travel. Their greatest ambition is apparently to fly, and when they do, it is with delight and absolutely without fear.

Secondly, this traditional fear of flying has perhaps been stimulated by the sensational recital of airplane disasters. Airplane accidents are still news and are generally of such a spectacular nature that they have reached the front page of the newspapers and are thus emphasized upon the public mind. Will Rogers, with the philosophy that so often characterizes his humor, has said of this:

"Five people killed in plane yesterday and it is headlined today in every paper. Saturday, in Los Angeles, at one grade crossing seven were killed and six wounded and the papers didn't even publish the names. It looks like the only way you can get any publicity on your death is to be killed in a plane. It's no novelty to be killed in an auto any more."

Hardly any of the accidents that have been brought so vividly to public attention have any place in commercial aviation of today. Nearly every one of them can be included in one of the following categories:

1. Accidents that took place in pre-war flying were often due to structural failure and inexperience, natural to a new art. Mechanical failures, such as the breaking of a wing, for example, are today unknown in normal flying with the best modern equipment.

2. War-time accidents are still actively in our memories and we have impressions of heroic air fighting and air crashes. However, these accidents should be no

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Notes from an address, December 15, before the New York Railroad Club.

more attributed to flying than the dangers of cavalry charges should be confounded with those of horseback riding.

3. Stunt flights probably have not taken life in great numbers, but on account of their extremely spectacular nature, accidents from these flights have been closely followed by the public.

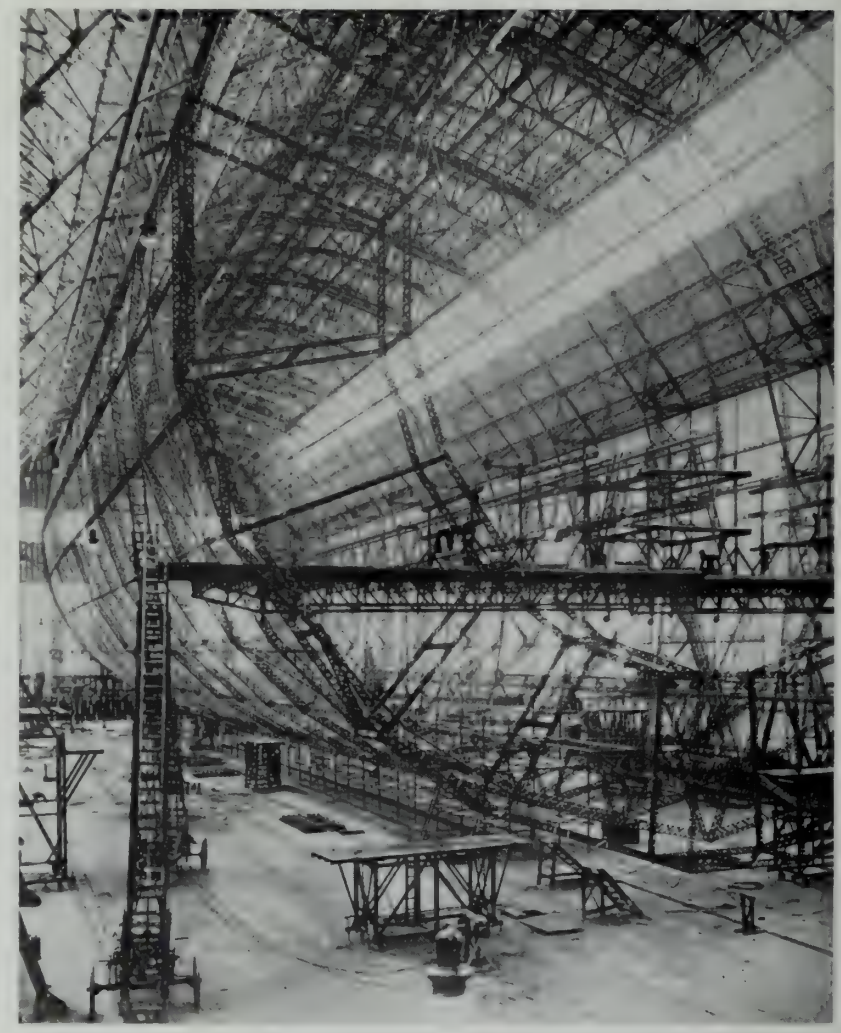
4. Reckless private flying has been the cause of many accidents, but here again this is no more a normal danger of flying than the reckless driving of a young man in a motor car, which crashes into a telegraph pole, is a normal danger of motoring.

5. Experimental flying constantly causes the death of many gallant aviators. These are pioneers who, like other pioneers throughout the ages, are thoroughly conscious of the danger and make the supreme sacrifice so that humanity may progress.

6. Military and naval aviation have in the past accounted for nearly all the flying, but that time is rapidly passing. War is not exactly a safe pursuit, and the dangers of military and naval aviation are an item in the price we must pay for preparedness in time of war. But accidents in this necessary service must not be laid at the door of commercial aviation.

Commercial aviation should not be liable to any of these dangers. Transportation of passengers under properly organized conditions has reached a state of safety comparable with other means of transportation.

As to construction and operation: there are some fundamental economic considerations in air transport which offer opportunity for comparison with other forms of transportation. For example, the cost of roadways and railways, including not only the tremendous cost of surfacing and laying rails, but also the cost of grading, driving tunnels, building bridges and snowsheds, with all the other appurtenances of railroad building, is a cost that is almost entirely eliminated in the construction of an airway. In addition, the cost of maintenance of an airway is but an insignificant sum in comparison with the cost of maintenance of roadways and railways.



This is the Z-127, Now Building in Germany for Passenger Service Between Spain and South America. It will have a Dining Room, Sitting Room, Electric Kitchen, and Ten Bedrooms With Two Beds in Each. There'll Be a Crew of 26. The Z-127 is to Be 770 Feet Long, and Will Fly 80 Miles An Hour. P & A Photos.

Both the cost of construction of airways and their maintenance has been properly assumed by the federal government on the same theory that has prompted the federal government to construct and maintain seaports. I understand that there has been some criticism of this government aid to air transport. I think this is an unjust criticism, and its unfairness will be readily recognized by railroad men in view of the tremendous sums of money spent by the government in support of the railroads during their pioneering days.

The cost of operation of an airplane is comparatively small. Gasoline consumption of a plane equipped with a 200 h.p. Whirlwind motor is about 13 gallons an hour, and about one pint of oil in the same time, for a 90-mile an hour speed. Compare this with the gasoline and oil consumption of a motor car for a run of 90 miles. And the only wear on the airplane's tires—two of them—is during the few moments it is rising or landing on the ground.

The price of a modern, single-engine plane equipped with a Wright Whirlwind motor is about

$12,500. Of this amount $5,000 is for the engine, and this is based on a production, last year, of about 350 engines.

Although these comparisons are, I think, fundamental and significant of future development, one should mention, in all fairness, the present day price of multi-engine passenger equipment. The most modern three-engine equipment capable of carrying ten passengers and two pilots, and 500 pounds of baggage costs about $60,000. At a price around 12 cents and possibly ten cents a mile, if reasonably full loads can be maintained a commercial success should be possible under highly efficient operation.

The major cost of airplane operation, however, is depreciation and obsolescence. Although there is little accurate knowledge of the depreciation rate of modern airplanes, nevertheless at the present time every capable airplane operator writes off his equipment over a period of between two and three years. With the lightning-like changes that are taking place in the airplane, the conservative operator will anticipate a revolutionary alteration in his equipment at the end of between two and three years.

There are certain disadvantages in air transport today that are gradually being overcome. One of the most important is the excessive time needed to reach a city from its airport. For example, when Lindbergh flew from Detroit to New York in the record time of two hours and 43 minutes, he consumed over an hour more in traveling between the airport and the heart of New York. In aviation of the future, with the development of both airplanes and landing facilities, passengers will be discharged within a very few minutes of the centers of great cities.

At the present moment aviation needs the support of the railroads. The economic advantages of the co-ordination of rail and air transportation are very great from the air operator's standpoint:

First: His large expense of advertising and ticket selling will be eliminated; and second, the opportunity which the railroad would offer of taking a limited number of passengers off the trains at certain points to fill the airplane is obviously of the utmost importance. In addition, under unfavorable weather conditions of fog and sleet, the only two conditions under which airplanes cannot safely travel at the present time, the railroad facilities could be used without too great inconvenience to passengers.

This is the situation as it exists today. Tomorrow there may be, and undoubtedly will be, a complete readjustment in these economic factors. For example, to consider just one of them: should the commercial cruising speed of the airplane be increased from 90 to 180 miles an hour, the commercial opportunities for air transport would be enormously extended, in spite of the country's highly organized railway system.

The developments with which the aviation industry is now experimenting are developments which almost over-night may es-

P. & A. Photo

When Colonel Lindbergh Flew Into Mexico City the People Pelted Him With Confetti and Flowers. This is a Snap Shot Showing America's Unofficial Ambassador Before the Cheering Thousands.

The President's Resolution

Whereas, our road has improved its operating efficiency to an unusual degree during 1927, and as we consider it necessary still further to improve that efficiency, and,

Whereas, one of the greatest economies possible is the reduction of loss and damage now occurring to our lading and equipment, therefore

Be it Resolved, that in view of the fact that many roads now secure proper protection for both their lading and equipment through the use of Sessions-Standard draft gear, we will without further delay investigate just how our road can be given that protection.

A Dividend Maker, President
XYZ Railroad Co.

STANDARD COUPLER CO.
NEW YORK CHICAGO

tablish a transportation system which the railroads will need as much as aviation needs the support of the railroads.

Notes About Aviation All the World Over

The story of transoceanic flying in 1927 is not particularly cheerful reading.

Six planes and thirteen persons crossed the Atlantic safely. Five planes and twelve persons were lost.

Four planes and eight persons crossed the Pacific safely. Three planes and seven persons have been lost.

Five persons lost their lives in preparatory flights, and a sixth vanished in an effort to fly from North to South America across the Caribbean.

The total is:

Ten successful flights, nine failures. Twenty-one lives spared and twenty-five lost.

Thirteen planes have been destroyed, millions of dollars have been expended in promotion of this phase of flying, and hundreds of thousands more have been spent in futile searches for the lost.

To offset this cost in life, money and property, the airmindedness of the Nation and the world has been increased, a start has been made at laying a foundation for transportation by air, and the successful flights have fostered a huge store of international good will.

One woman—Ruth Elder—is among the successful flyers. Two, Miss Mildred Doran and Princess Lowenstein-Wertheimer, are among the lost.

The men who crossed the Atlantic were Colonel Charles A. Lindbergh, Clarence D. Chamberlin and Charles A. Levine, Commander Richard E. Byrd, Lieutenant George Noville, Bernt Balchen and Bert Acosta, William S. Brock and Edward F. Schlee, George V. Haldeman, co-pilot with Miss Elder in the flight which ended in the Atlantic ocean off the coast of Spain, and Dieudonne Costes and Joseph LeBrix, who flew from Africa to South America.

The men who crossed the Pacific to Hawaii were Lieutenants Lester J. Maitland and Albert F. Hegenberger; Ernest L. Smith and Emory B. Bronte; Arthur Goebel and Lieutenant W. V. Davis; and Martin Jensen and Paul Schluter.

All these flights, except the Costes-Le Brix venture, were of American origin.

Those who perished in the Atlantic included, besides the Princess Lowenstein, four Frenchmen, three Americans, two Englishmen and two Canadians: Captain Charles Nungesser and Francois Coli, flying from France to America; Captain St. Roman and Commander Noumeyers, flying from Africa to South America; Philip Payne, J. D. Hill and Lloyd Bertaud, flying from the United States to Rome; Captain Leslie Hamilton and Lieutenant-Colonel F. F. Minchin, flying from England to America, and Captain James Medcalf and Lieutenant Terence Tully, flying from Canada to England.

Those lost in the Pacific, in addition to Miss Doran: J. A. Pedlar and Lieutenant V. R. Knope, her colleagues; Captain William P. Erwin and A. H. Eichwaldt; J. W. Frost and Gordon Scott.

Paul Redfern of Brunswick, Ga., was lost on a Brazil flight, and Commander Noel Davis, Lieutenant Stanton H. Wooster, Lieutenant George Covell and R. S. Waggener were killed in preparation for flights.

The Atlantic has been crossed this season four times from North America to Europe, in addition to Miss Elder's flight part way, and once from Africa to South America. No venture at a westward crossing from Europe succeeded.

The Pacific has been crossed from North America to the Hawaiian islands four times, but no flight has been made from the islands to the United States nor from the islands onward to Asia or Australia.

The Boeing Airplane Co. is building three 12-passenger cabin biplanes to be placed in service between Chicago and San Francisco early next summer. The planes, which will cost $65,000 each, are to attain a speed of 125 miles an hour and will be equipped with light-lunch buffets.

P. B. Johnson, president of the company, said that "as far as furnishings and equipment are concerned, the planes will excel any of the air liners now in service in Europe."

Within five years mail from New York will be delivered in London in three days by steamers and airplanes, according to a prediction by Second Assistant Postmaster General Glover on his return from the international air mail conference in Paris.

Air service between the mountain resort of Karuiza and Tokio is proposed, covering the distance that takes five hours by train in less than 30 minutes. This resort is frequented largely by missionaries who spend their vacations there. Test flights have already been made. A fare of $5 each way is suggested.

A non-stop flight from Mexico City to Juarez (El Paso) was made in September by Captain Emilio Carranza, of the Mexican aviation service. The distance of 1,667 kilometers was covered in 10 hours and 51 minutes. At one point during the flight the plane became ignited. Just as Captain Carranza was on the point of abandoning the machine, he ran into a heavy rain which put out the flames. The flight was made in a monoplane constructed at the Aviation Field of Valbuena, Mexico City, with an imported motor and other materials.

L&N

INDICATION OF SERVICE

"From the start, the tractor and trailer operation was a success, largely —if not entirely—due to the very efficient manner in which your Mr. Miller instructed our men and assisted in reorganizing our station.

RESULT OF SERVICE

"And the following morning we started work with some seventy less men than had been used under the two wheel operation.

"The saving effected has several times paid for the equipment, and the service which has been possible to render patrons has, in my opinion, amounted to more than the money saved in cost of handling freight."

THIS SERVICE YOURS TO COMMAND

Just as R. D. Ross, Assistant Superintendent of Louisville & Nashville Railroad used Mercury service to establish phenomenal results in terminal operation, so you can command the same abilities and experience in developing methods of reducing costs of handling your l. c. l.

For over fourteen years, Mercury has worked incessantly with terminal problems. Their success is outstanding, because of completeness of engineering talent they bring to each job, and because of the wealth of experience they can draw upon to meet any situation.

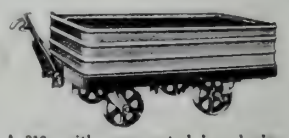
Write today, and let us show you the unique method with which we attack new problems. There's no obligation—write today.

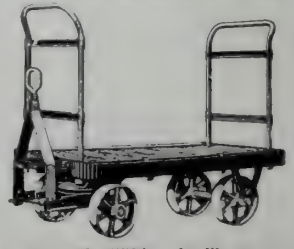
MERCURY MANUFACTURING CO.
4120 South Halsted St. Chicago, Ill.

MercurY
Trackless Train

Mercury "Type H" Tractor

A-310—all purpose "castor steer" trailer.


A-310—with corrugated box body.

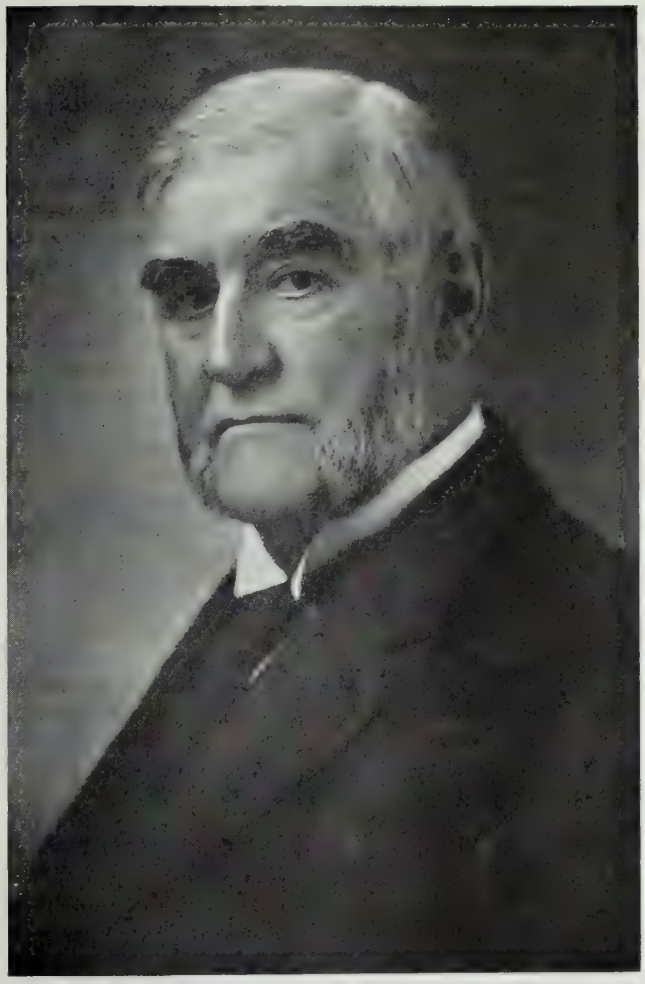

A-610—with "fifth wheel" steer

Long Career of Marvin Hughitt Ends

A Railroad Builder

By H. W. Walsh

MARVIN Hughitt, chairman of the finance committee of the Chicago & North Western Ry., died Thursday, Jan. 5, at his home, Lake Forest, Chicago. Mr. Hughitt was almost 91 years old. The funeral, attended by financial, transportation and social leaders of the nation, took place Monday, January 9. Burial was in Rose Hill cemetery. Every train on the North Western System stopped turning for three minutes at 11:30 a.m., the funeral hour, in final tribute to the man who had risen from a position as telegraph operator, more than 71 years ago, to become the organizer and builder and finally the financial head of a great railroad system.



Marvin Hughitt.

Marvin Hughitt was three years younger than his distinguished friend, Chauncey M. Depew of the New York Central, but he started his railroad career ten years sooner. Mr. Depew still is active, and Mr. Hughitt kept control of his business affairs to the very last.

Like most of the successful men of the nation, Marvin Hughitt's origin was humble. He was born on a farm near Genoa, N. Y., August 9, 1837. He came from good stock, he was a bright youngster, and he got what there was to get in the rural district school of his county. At 14 he became interested in Morse's invention, the telegraph, and gained his parents' consent to his studying the thing at Auburn, the county seat. There he became a messenger boy, learned telegraphy, and only a year after beginning had a job as an operator at Albany.

It was while at this work that he was discovered by Judge John D. Caton of Illinois who chanced into the office to send a telegram. The boy's brightness and efficiency attracted the judge so much that two years later when he organized the Illinois & Mississippi Telegraph Co. and opened an office at Chicago, he employed the intelligent telegraph boy in Albany. Thus it was that Marvin Hughitt, at the age of 17, went to Chicago and became one of the first two telegraphers in the West. Shortly thereafter, while still in his teens, he was made superintendent of Judge Caton's company, which had the original contract for the operation of a telegraph line on the Illinois Central R.R. in Illinois.

In 1856, two years after young Hughitt had moved to Illinois, he got a job with the St. Louis, Alton & Chicago R.R., now the Chicago & Alton, as superintendent of telegraph and train dispatcher. For the next six years Hughitt remained with this railroad, and during that time made an excellent record as a railway train dispatcher.

In the meantime the war between the states had broken out, and the demands upon the Illinois Central for the movement of troops, munitions and army supplies were exceedingly heavy due to its peculiar geographical location as the leading highway of commerce between the North and the South. At the same time many efficient officers of the Illinois Central had entered the military service. A capable trainmaster was needed on the southern division and the place was given to young Hughitt. That was in 1862. By 1870, although only 33 years old, he had become general superintendent. From this time his rise was steady and rapid. He became president of the C. & N. W. in 1887.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

IN ORDER that the exhibit of the Railway Supply Manufacturers' Association may not conflict with that of the National Electric Light Association the date of the meeting of Division V (Mechanical) of the American Railway Association has been changed to June 20-27 and of Division VI (Purchases & Stores) to June 20-22. In order to house all of the exhibits on the Million Dollar Pier an addition approximately 600 ft. long by 116 ft. wide is to be erected.

Commissioner Esch Status Uncertain

John J. Esch was reappointed a member of the I.C.C. by President Coolidge on December 19. The nomination was referred to the senate committee on interstate commerce, however, where action was postponed until after the holidays. As Commissioner Esch's term expired at the end of the year the committee's failure to act left a temporary vacancy in the membership.

Motor Transport Division of A.R.A.

Representatives of railroads from the United States and Canada will be in Chicago on January 25 and 26 to effect a permanent organization of the Motor Transport Division of the A.R.A., just created, and to outline the work of that division. The meeting will be held at the Palmer House. A. P. Russell, of the New Haven, is temporary chairman of the new division. Permanent officers will be elected as well as a permanent general committee to have general supervision over the work of the division.

Creation of the Motor Transport Division resulted from the large number of roads now supplementing rail service with motor buses. The new organization has as its purpose the bringing together of the railroads interested in the development of motor transportation, freight or passenger, to study the problems of such transportation and, through the coordination of the rail carriers, to devise the most effective means for the development of that form of transportation. The division will give its attention to a study of the application of the motor bus and motor truck to the use of steam railroads, and of the rail motor car to the use of the steam railroads.

New Subway Plan for Chicago

A new plan for a subway in Chicago was announced by Mayor Thompson, Dec. 29. He would widen and double deck the streets with a level below present street grade. On either side of an open sunken roadway would be two rapid transit tracks for electric railways and above these tracks, on the original street level, would be roadways for trucks and slow-moving vehicles. The sunken roadway in the center would be given over to high-speed automobile traffic. The mayor states that his plans are tentative only, subject to public approval.

Buses Prove Popular in North

Transition of passenger business from railroads to motor buses is only started, in the opinion of Ralph Budd, president of the Great Northern, which owns the Northland Transportation Co., the largest operator of motor buses in the Northwest. People prefer to ride on the highways, Budd says, and predicts the motor bus business will continue to expand. Since 1921, he adds, there has been a large reduction in the number of passenger trains operated in the Northwest. A great many of these trains have been replaced by gas-electric cars, comparatively large fleets of which have been built up by the Great Northern and Northern Pacific.

Reading Electrification

President Dice of the Reading Company has announced that in the early spring his company intends to embark upon an electrification program which will take several years to develop. When weather permits, work on grade crossing elimination through Germantown and Chestnut Hill will begin as the first step in the electrification of the Chestnut Hill branch. Great strides also will be made during the year on grade crossing elimination through Manayunk and Wissahickon.

Increase for North Shore Line

Intrastate passenger fares on the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., were ordered raised from 3 cents to 3.6 cents a mile by the I.C.C., Dec. 22. The increase, which was granted in order to remove unjust discrimination against interstate commerce, is to become effective on or before Feb. 15.

Appeal to the Interstate Commerce Commission was resorted to by the railroad following the refusal of the Illinois and Wisconsin public utility commissions to allow an increase in rates within the two states. The interstate fares of the North Shore Line were increased last spring from 3 to 3.6 cents a mile, to match the steam railroads' tariffs.

Bill to Regulate Interstate Buses

A comprehensive system for state boards, to regulate interstate buses, with final jurisdiction lodged in the I.C.C., is provided in a bill introduced by Representative Parker of New York, chairman of the house interstate and foreign commerce committee at Washington on December 13.

Panama Canal Traffic

November was the second largest month since the opening of the Panama Canal with respect to the number of commercial vessels passing through, being exceeded only by October, 1927. In November, 559 ships and 14 launches passed through the canal, and an aggregate of $2,369,385 in tolls was collected, while in October the tolls amounted to $2,380,115. The net tonnage of commercial vessels was greater in November by 5,965 tons, however, than in October.

Los Angeles Harbor Terminal

The Outer Harbor Terminal Ry. has been authorized by the I.C.C. to acquire and operate a line of road owned by the City of Los Angeles, and to issue $130,000 of capital stock in payment for property to be acquired.

I.C.C. Denies D. & H. Application

The I.C.C. has denied application of the Delaware & Hudson Co. for authority to acquire control, by lease, of the Buffalo, Rochester & Pittsburgh and also the D. & H.'s application to operate over the Pennsylvania under trackage rights between Buttonwood and Dubois, Pa.

The commission held that both the proposed leasing of the B., R., & P. and operations over the Pennsylvania were not in the public interests and further stated that estimates of economies to be derived from the proposed acquisition of B., R., & P., were "too optimistic," and that while these economies might benefit the D. & H., "it is not apparent that the public would reap much advantage." With respect to acquiring

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trackage rights over the Pennsylvania between Buttonwood and Dubois, Pa., the commission pointed out that while considerable traffic might be diverted to this route, and the D., & H., doubtless would derive some advantage from the combined operation of the two roads, the advantages to be gained "are overestimated." Commissioners Meyer, Esch, Aitchison, Eastman and Taylor filed dissenting opinions while Commissioners Woodlock and Lewis submitted concurring opinions.

S. P. Considering Bus Operation in Texas

The Southern Pacific Co. is making an exhaustive survey of railroad conditions in Texas which may result in the company's adopting bus lines, according to A. D. McDonald, vice chairman of the executive committee, who says:

"We are operating buses in California and the plan seems successful. One difference between conditions in Texas and California, however, is that many of our trains here carry more express matter which imposes a difficulty in supplementing them with bus lines. Last summer, the lines in Texas established week-end fares with extreme reductions, the policy proving highly successful. The automobile is here to stay, and consequently we feel we must meet its competition, which we can do best by low-

Buses Increase During 1927

A. J. Brosseau, in a statement released by the National Automobile Chamber of Commerce, says, "Increasing use of buses by steam railroads has resulted in doubling the number of bus units in railroad service from about 600 on January 1, 1927, to about 1,200 on January 1, 1928. This growth in the steam railroad field, while not so large as expected, or so warranted by the economies involved, reflects a steady growth that has been very satisfactory to the railroads as well as to the public. About 60 railroads are using buses either directly or through subsidiaries." He further stated that the number of buses operated by street railways had increased from 7,000 on January 1, 1927, to over 8,500.

Class I railroads in November had a net railway operating income amounting to $86,424,299, which, for that month, was at the annual rate of return of 3.71 per cent on their property investment, according to reports filed by the carriers with the bureau of railway economics. In November, 1926, their net railway operating income was $119,940,803 or 5.29 per cent on their property investment.

Property investment is the value of road and equipment as shown by the books of the railways, including materials, supplies and cash. The net railway operating income is what is left after the payment of operating expenses, taxes and equipment rentals but before interest and other fixed charges are paid.

This compilation as to earnings in November is based on reports from 183 Class I railroads representing a total mileage of 238,637 miles.

Gross operating revenues for November amounted to $503,819,802 compared with $562,255,818 in November, 1926, a decrease of 10.4 per cent. Operating expenses in November totaled $376,875,-841 compared with $403,586,299 in the same month in 1926, a decrease of 6.6 per cent.

Class I railroads in November paid $31,237,545 in taxes. This brought the total tax bill of the Class I railroads for the first 11 months in 1927 to $356,-146,960, a decrease of $8,825,650, 2.4 per cent below the corresponding period in 1926.

Thirty-one Class I railroads operated at a loss in November, of which 17 were in the eastern, four in the southern and ten in the western district.

Class I railroads for the first 11 months in 1927 had a net railway operating income amounting to $1,028,-542,175 which was at the annual rate of return of 4.55 per cent on their property investment. During the corresponding period the preceding year, their net railway operating income amounted to $1,-152,872,690 or 5.23 per cent on their property investment.

Gross operating revenues for the first 11 months in 1927 amounted to $5,739,-426,791 compared with $5,937,601,742 for the corresponding period in 1926 or a decrease of 3.3 per cent. Operating expenses for the first 11 months period of 1927 totaled $4,249,320,864 compared with $4,319,707,413 for the corresponding period the year before.

Bus Lines Merge

The California Transit Co., which operates the Pioneer Stages System, has purchased the Bell-line parlor cars operated between San Francisco and Portland. As a result of the consolidation, the California Transit Co. will extend the Bell line to Seattle and start a through service from Seattle to Los Angeles, via San Francisco.

O'Fallon Line Gets Time to Appeal

The I.C.C. has postponed from February 15 until April 30 the effective date of its order requiring the St. Louis & O'Fallon Ry. to pay the government $226,000 of excess earnings. This action is taken to permit the carrier to appeal to the Supreme Court from a recent decision of federal court in Missouri upholding the order of the commission.

Railway Construction

Tracks and Yards

ALABAMA.—The Meridian & Bigbee River Ry. has completed its line from Meridian, Miss., to Cromwell, Ala., 30 miles, and will now build the remaining 20 miles from Cromwell to Myrtlewood.

CALIFORNIA.—The Sacramento Northern has applied to the I.C.C. for authority to build a line seven miles long from a point near Armijo to a connection with the San Francisco-Sacramento.

KANSAS.—The Santa Fe has prepared plans for the construction in 1928 of additional yard facilities at Emporia. The project will include 16 tracks with capacity of 150 cars apiece, the remainder of the tracks to accommodate 60 and 90 cars apiece. Included in this work will be track scales, stock yards and yard office.

NEW HAMPSHIRE.—The Boston & Maine has announced a construction program aggregating $6,010,000, to make permanent the emergency reconstruction by which railroad service was resumed after the floods, and to make other improvements in the course of the year on bridges and roadbed elsewhere on the system. The program for 1928 includes 92 bridges which represent an aggregate of $2,050,000, of which about one-quarter is permanent replacement of structures washed away or damaged by the floods. The budget for improvements to right of way in other places with rock ballasting, heavier rails, more ample bridges, etc., represents the remainder of the proposed expenditures.

With the resumption of service on the Bristol branch, the Pemigewasset Valley branch and the Suncook Valley

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loop, Chief Engineer W. J. Backes reported that every mile of the 946 miles of Boston & Maine main line and branch line affected by the floods has now been restored to operation, excepting only one small summer resort branch. New steel structures now under production include new bridges at Hoosick Jct., N. Y., where a double stone arch bridge 200 feet long was carried away; at North Pownal, Vt., also on the Fitchburg division main line, where an additional steel span is needed to satisfy the new course of the Hoosick River; at Livermore Falls, N. H., and North Woodstock, where the Pemigewasset branch was washed out and restored with temporary trestles; and new steel spans for the bridge at Lebanon, N. H., with work on abutments and piers for bridges at Littleton, Groveton, Gorham, and at several other places. In addition to the immediate flood reconstruction, the bridge building budget for 1928 includes work at 19 other locations where flood waters made reconstruction necessary. These include Conway, N. H.; Franklin, Webster Lake, Halcyon, Westboro, Hooksett, Roby, Williamstown, Mass.; Hoosick Falls, N. Y.; Bath, N. H.; Thornton, West Thornton, East Northfield, Mass.; North Charlestown, Fairview, and Newbury, Vt. The Boston & Maine was hit in 101 places to an extent which made repair work in every case a major project. In all, 100,000 tons of stone and filling material have been or will be used to fill washed-out places, and to fortify the roadbed along river banks against any future floods. Work on bridges and roadbed is being pressed through the winter, under some difficulties, although most of the permanent roadway work will have to wait until the frost goes out.

PENNSYLVANIA.—The Pennsylvania Railroad plans to extend the facilities of its yard at Altoona, making it one of the largest. The eastbound advance freight yard, it is said, will be extended and a relay yard will be built.

TEXAS.—According to a statement credited to G. T. Atkins, vice president the Missouri-Kansas-Texas Lines will soon ask the I.C.C. for authority to construct an extension from San Antonio south to the Rio Grande, probably to Roma, approximately 200 miles. Survey for the proposed road has been made from San Antonio to Hebbronville, 150 miles, and officially approved. At Hebbronville the line would intersect the Texas Mexican Ry., between Laredo and Corpus Christi. The Missouri Pacific plans to extend its Lower Rio Grande Valley line from Rio Grande City to Roma, 18 miles, in 1928.

An extensive program of improvement of the Southern Pacific lines in Texas and Louisiana will be carried out during 1928, according to a statement made by A. D. McDonald, president of these lines, after he completed an inspection trip of the new lines in the Lower Rio Grande Valley. "From 1920 to September, 1927," he said, "the Southern Pacific spent on additions and betterments in Texas approximately $46,000,000. This does not include a substantial part of $24,000,000 worth of equipment purchased by the Southern Pacific Co. and leased to the Texas and Louisiana lines."

Buildings and Structures

INDIANA. — Lafayette. The Monon coaling station at this point was destroyed by fire in November. The company plans the immediate construction of a new one.

IOWA.—Marquette. The C.M. & St. P. will construct a three-span steel girder bridge at this point to replace a pile trestle.

MICHIGAN.—Ferndale. The Grand Trunk is planning the construction of a new enginehouse with a capacity for 50 locomotives, a car repair plant, and classification yards in Royal Oak township near Ferndale, to cost about $150,000.

MINNESOTA. — Minneapolis. Ralph Budd and Charles Donnelly, presidents of the Great Northern and Northern Pacific, have asked the city council of Minneapolis to defer action relative to grade crossing eliminations that would cost about $2,000,000 until the I.C.C. has given a decision in the application for merger. Should the Great Northern and Northern Pacific be permitted to consolidate, elimination of considerable local trackage could be effected, it is said.

—South Minneapolis. The C.M. & St. P. has been authorized by the federal court to construct a water treating plant to cost $28,580. The plant will have a capacity of 40,000 gals. an hour.

MISSOURI.—St. Louis. It is reported the Wabash Ry. will build a passenger station at Delmar boulevard in connection with the viaduct now being constructed at that point.

MONTANA.—Laurel. The Northern Pacific will build new car shops at Laurel. It is estimated that shops and equipment will cost about $250,000.

NEVADA.—Caliente. The Union Pacific has let a contract to the Rhyberg-Sorenson Co. of Salt Lake City for an employes' clubhouse to cost about $90,000.

—Palisade. The Eureka Nevada Ry. has let a contract to the Truscon Steel Co. for a new steel enginehouse at this point to replace the one recently burned.

NEW HAMPSHIRE.—Concord. The Boston & Maine is said to be figuring on building new car repair shops at this point, to cost about $150,000.

—Dover. The Boston & Maine has let a contract for changes to be made in its passenger station at this point.

NEW YORK.—Olean. The Pennsylvania has let a contract to the Austin Company of Cleveland for a one-story steel stores building.

NORTH CAROLINA.—South Rocky Mount. The Atlantic Coast Line will rebuild the portion of its Emerson shops recently burned. The loss was estimated at about $30,000.

OHIO.—Cincinnati. The Cincinnati Union Terminal Co. filed a petition with the I.C.C. Dec. 29 asking for authority to construct the proposed $31,500,000 union passenger station. The financing plan calls for issuance by the terminal company of $3,500,000 in common capital stock which would be owned in equal shares by the railroads and for another issue of $3,000,000 in preferred stock which would be sold to Cincinnati business interests. The balance of the funds necessary would be procured by issuing $25,000,000 in bonds which the participating railroads would guarantee. William Cooper Proctor and James Clark Wallace also asked the commission to give them permission to become directors of the terminal corporation in furtherance of its construction plan.

—Woodsdale. The Baltimore & Ohio has let a contract to the Vang Construction Co., Cumberland, Md., for a bridge, and grading work estimated to cost $175,000.

PENNSYLVANIA.—Philadelphia. Agnew T. Dice, president of the Reading, has announced that the Port Richmond grain elevator, erected at a cost of $4,000,000 and having a capacity of 2,500,000 bushels, will be opened officially January 14. With the completion of this elevator the port of Philadelphia will have unrivaled facilities on the Atlantic Coast for exporting grain. New equipment on several Delaware River piers also will add to the advantages of the port. He also states that final working plans are in the course of completion for the $2,000,000 North Broad street station, and that bids for the structure will be invited in the near future.

WASHINGTON.—Rockdale. The C.M. & St. P. has been authorized by the federal court to spend $34,800 for a snowshed one mile west of here.

Locomotive Orders

The Class I railroads, in the first eleven months of 1927, placed in service a total of 1,820 locomotives of which 149 were installed in November. During the same period in 1926 2,193 were placed in service. Locomotives on order, December 1, 1927, numbered only 69 as compared with 344 on the same date in 1926. There was some improvement in orders, however, during December when more than 135 engines were ordered. The largest order placed was that of the Southern, which contracted with Baldwin for 55 Mikado, 8 Mallet and 5 Pacific engines. The Boston & Maine came out with an announcement to the effect that it had ordered 20 2-8-4 locomotives that will weigh 385,000 pounds from the Lima Locomotive Works. The company's statement said these engines are to have a boiler pressure of 250 lbs., a grate area of 100 sq. ft., and that they will be equipped with articulated trailing trucks similar to the Lima engine built originally for the B. & A. The engines are to be used principally for the road's fast freight service between the Hudson River gateways and the ocean. They will make the run from Rotterdam Junction and Mechanicville, N. Y., to Boston without change, and are expected to reduce the running time two hours. This road also put into service on December 19 the first two of the 10 eight-wheel switch engines ordered recently from the Baldwin Locomotive Works.

The Texas & Pacific has placed an order with the Lima Locomotive Works for 15 Texas type engines. Other orders recently placed were those of the Mobile & Ohio. The Clemons Logging Co. ordered a Mallet from Baldwin and the Alabama, Tennessee & Northern a Decapod and the Seaboard Air Line 25 switchers from the same builder. Rumors are current that the Illinois Central and the Pere Marquette will buy some new power before long. The Great Northern has the following on its equipment program for 1928: Building 10 Mallet type locomotives, building 18 locomotive tenders, adding booster engines to 12 locomotives; converting 100 locomotives from compound to simple type, and equipping them with modern superheaters; constructing four steam heat tenders for use with electric locomotives; converting 15 Mountain type locomotives into Santa Fe type; equipping 75 locomotives with exhaust steam injectors.

Other interesting developments during December in the locomotive industry were the reports from abroad that Austria has decided to abandon further electrification of its railroads. In making the announcement the state railroad administration explains that the reduction in the price of coal and the fact that the improvement in steam locomotive design has reduced the coal consumed from 157 kilograms per unit of 1,000 tons hauled seven years ago to the present figure of 104 kilograms, is largely responsible for the decision.

Reports state that the Baldwin Locomotive Works shipped during 1927 a total of 655 locomotives, against 843 in 1926. Of the total, 486 were steam locomotives against 645 last year, 165 electric locomotives against 196, and four gasoline locomotives against two shipped last year.

In December the American Locomotive Co. delivered to the New Haven the first of the ten new heavy freight locomotives which it has been building at Schenectady. The engine is 97 feet long, weighs 350 tons in working order, and the tender has a capacity of 18 tons of coal and 16,000 gallons of water.

Passenger Car Orders

Of course, there is only one way to start off this month; the Pennsylvania's inquiry for a total of 690 passenger train cars to cost between $10,000,000 and $12,000,000. In detail this inquiry is for 200 coaches; 300 refrigerator cars for passenger train service; 100 combination baggage and express cars; 45 baggage and scenery cars; 25 horse, and 20 combination passenger and baggage cars. Other inquiries which developed during December were St. Louis-San Francisco, 15 combination baggage and mail and five baggage cars; Delaware & Hudson, eight combination baggage and mail; Mobile & Ohio, six coaches; and Nashville, Chattanooga & St. Louis, two combination passenger and baggage, and two straight baggage cars. The largest order placed was the one from the Santa Fe, which called for 76 cars to cost about $3,500,000, and it was awarded to the Pullman Car & Mfg. Co. The details as to types, etc., were given in our December issue when we reported the inquiry. C. W. McNear & Co. of Chicago have agreed with the Seattle city council that they will order 50 new cars from the Pacific Car & Foundry Co., and then lease them to the city for 15 years. Under the arrangement the city will pay $50,000 a year for the first four years and $120,000 a year during the next eleven years. At the expiration of the lease the cars will become the property of the city. Other orders placed during December include the following: Illinois Central, 20 84-passenger suburban coaches equipped with roller bearings ordered from Pullman; New York, Westchester & Boston, 10 electric motor cars ordered from Osgood-Bradley; Southern Ry., 23 combination baggage and express and two postal cars ordered from Bethlehem Steel Corp.; Louisville & Nashville, two baggage, six combination passenger and baggage, four middle compartment smoking coaches, four coaches ordered from American Car & Fdry. Co.; Washington Ry. & Elect. Co., Washington, D. C., 12 electric cars ordered from J. G. Brill Co.; Pennsylvania R.R., six gas-electric cars ordered from J. G. Brill Co.; Chicago & Eastern Illinois, two combination mail and smoking cars ordered from Pullman.

Freight Car Orders

Freight cars placed in service the first 11 months of 1927 by the Class I railroads, totaled 72,228, according to reports filed with the American Railway Association, a decrease of 27,137 from corresponding period of 1926. The railroads installed 5,864 freight cars in November, which included 2,000 box cars, 3,292 coal and 109 refrigerator cars. On December 1, 1927, there were 9,850 freight cars on order, compared with 14,564 on the same date in 1926. December proved to be a life saver in a dead market. We said in December there were indications that freight car buying would open up. It has, and how! In the following statement we show that 14,141 cars have been ordered and that there still are inquiries for 8,231 cars pending, with more in sight, many of which no doubt will be ordered before this reaches the readers.

The largest orders placed were those of the Southern and Santa Fe. The Southern ordered a total of 4,750 cars from the contract builders and 750 from the Lenoir Car Co., a subsidiary of the railroad. The order was divided as follows: 2,000 hoppers from Standard Steel Car Co.; 750 hoppers from Mt. Vernon Car & Mfg. Co.; 1,750 automobile box cars from the American Car & Foundry Co.; 250 ballast cars from the Rodger Ballast Car Co.; 500 gondolas and 250 cabooses from Lenoir. The Santa Fe order was for 3,850 cars, divided as follows: 750 stock from Pennsylvania Tank Car Co.; 500 gondola, 300 flats and 100 caboose from Amer. Car & Fdry.; 500 box and 500 refrigerators from Pullman Car & Mfg. Co.; 500 automobile from General American Car Co.; 500 box from Mt. Vernon Car & Mfg. Co., 100 ballast from Rodger Ballast Car Co., and 100 dump from Magor Car Co.

The Louisville & Nashville has ordered 2,150 cars, divided between the

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Pressed Steel Car Co. and the Mt. Vernon Car & Mfg. Co. Pressed Steel will build 1,250 gondolas and Mt. Vernon 200 lowside gondolas, 200 automobile, 300 box and 200 stock cars. The Chicago & North Western ordered 1,000 more cars, 500 of which are 70-ton hoppers to be built by Pullman and the other 500 are 50-ton flat cars to be built by American Car & Foundry. The Mobile & Ohio ordered 450 cars from Mt. Vernon Car Mfg. Co. and 250 from General American.

Other orders placed during the month were as follows: Warner-Quinlan Co., 15 insulated tank cars of 10,000 gals. capacity, from American Car & Fdry. Co.; Gulf, Mobile & Northern, 12 30-yard dump cars from Koppel Industrial Car & Equip. Co.; Carnegie Steel Co., four flat cars from Tennessee, Coal, Iron & R.R. Co.; Lehigh Coal & Navigation Co., four dump cars from Clark Car Co., which also received orders for two dump cars from the Maryland Slag Co., two from Timken Roller Bearing Co. and one from Luzerne County Gas & Electric Co.

The largest inquiry in the market is that of the Frisco for 4,000 cars. The company is asking for prices on 1,500 hoppers, 1,500 box, 500 automobile and 500 flat cars. The Pacific Fruit Express is negotiating for 2,000 refrigerator cars to cost about six million dollars. These cars will bring the total owned by that company available to handle its business this year up to 40,311. The Texas & Pacific has been in the market for 500 drop bottom gondolas, 300 flats, 200 automobile cars and 10 caboose. The Central of Georgia will buy 500 cars.

Wilson & Company are inquiring for prices on 300 refrigerators and the Texas Company for 300 insulated tank cars of 10,000 gals. capacity. The Bangor & Aroostook is in the market for 100 box cars, the Lehigh & New England for six caboose and repairs for 200 gondolas, the United Fruit for 15 20-ton flats, Swift & Co. for 300 underframes for refrigerator cars and the Northern Pacific for 50 caboose underframes.

Rumors say the Erie will enter the market before long for cars, and also that the Baltimore & Ohio is expected to ask for prices on 8,000 cars.

The Great Northern's equipment program for 1928 includes the building of 1,000 cars, the reconstructing of 5,000 box cars and the equipping of 2,500 cars with steel underframes.

Industrial Tractor Orders

November shipments of electric industrial trucks and tractors, as reported to the department of commerce by the nine leading manufacturers in the industry, were 98 as compared with 109 in October and 123 in November, 1926. Total shipments for the first 11 months of 1927 were 1,163 as compared with 1,297 for the same period in 1926.

Bus & Truck Orders

A statement from the department of commerce, based on reports received from 120 manufacturers, shows that in November, 24,299 trucks and buses were produced (factory sales) by them. This compares with 36,669 for October of 1927, and 33,881 for November, 1926. Total factory sales for the first 11 months of 1927 were 427,200 as compared with 461,960 for the same period in the previous year. Recent bus orders include the following: County Transportation Co., 18 29-passenger Mack city type; Cleveland Southwestern Ry. & Ltg. Co., four Whites with Bender bodies; Boston Elevated Ry., one White model 54 and two Mack city type; Utah Light & Traction Co., five Mack chassis; Hamburg Ry., one Mack parlor car coach; Connecticut Co., five Mack city type buses; Pickwick Stages System, one Mack six-cylinder chassis; Harris & Harris, Denver, four Mack parlor car coaches; Lang Transportation Co., Long Beach, Cal., 30 Mack bus chassis; H. C. Guillaume, Chicago, three Mack parlor car coaches; Public Service Transportation Co., Newark, N. J., three Mack parlor car coaches; Suburban Bus Line, Newark, N. J., two Mack city type; Troy Fifth Ave. Bus Co., two Mack city type.

Changes in Personnel

Executive and Operating

Johnston B. Campbell of Spokane, Wash. who has been a member of the I. C. C. since 1921 was elected chairman of the commission December 30.

L. H. Fry has been appointed trainmaster of the first division of the Oregon-Washington R.R. & Navigation Co., with headquarters at Portland.

M. C. Williams has been appointed superintendent of the third division of the Oregon-Washington R.R. & Navigation Co. to succeed **I. N. Connolly** who has retired.

Clark V. Wood, Jr., formerly connected with the Springfield Street Ry. and the United Electric Railways, has been appointed assistant supervisor of the Connecticut lines of the New England Transportation Co., a subsidiary of the New Haven R.R.

J. W. Smith, assistant to the president of the Boston & Maine has been appointed general manager of the road. **A. H. Slader,** assistant to the president, has been appointed assistant general manager (personnel) and **Samuel E. Miller,** general superintendent, assistant general manager (operations). The new general manager, since going with the Boston & Maine last summer, has made an intensive study of the system with a view to further expediting service in connection with the extensive improvements already made and being made. For five years Mr. Smith was general manager of the Indiana Harbor Belt, an important part of the great Chicago terminal system of which, until last year, Mr. Hannauer was vice president. Himself the son of a railroad track supervisor, Mr. Smith came up through the ranks as brakeman, yardmaster and superintendent. He is 48 years old.

Assistant General Manager Miller has been general superintendent of the Boston & Maine for nearly two years. He was previously superintendent of the southern division, and had served also as general superintendent of transportation. He started work with the road as ticket seller and telegraph operator at Beverly in 1899, when he was 17 years old.

Assistant General Manager Slader started railroading as an office boy on the Old Colony Railroad in 1891, at the age of 13, and was connected with the New Haven road in various capacities for 20 years. He joined the Boston & Maine in 1913 as chief clerk to the general manager, and has since been successively assistant to the federal manager, to the vice president and general manager, and to the president for the last 10 years. The title of **Walter H. Towne,** assistant general superintendent,

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will be changed to superintendent of transportation.

Alfred R. Howard has retired as vice president, secretary and treasurer of the International-Great Northern. Mr. Howard started his railroad career as an axman on the I. & G. N. in 1871.

George H. Foster, acting vice president of the Lehigh Valley, has been elected vice president in charge of the operating department. **R. W. Barrett,** general counsel, has been elected vice president and general counsel. **F. L. Blendinger,** formerly vice president in charge of operations, resigned because of ill health.

Charles Donnelly, president of the Northern Pacific, has announced that under a new plan of organization for the western district of the railway, the duties and responsibilities of the late **George T. Reid,** vice president, will be divided. **W. E. Coman,** now western traffic manager, will have the title of assistant to the president, with headquarters at Seattle, representing the excutive department. **C. H. Winders** will be western counsel and **J. L. Burnham** succeeds Mr. Coman as western traffic manager. **J. L. Norton** succeeds Mr. Burnham as assistant general freight and passenger agent at Tacoma.

Mr. Coman is a native of Wisconsin. At the age of 16 he began railroad work as a clerk with the Burlington at Kansas City. He went west shortly afterward and entered the service of the Union Pacific at Portland. With the exception of two intervals he has been continually identified with railroad work in the Pacific Northwest. For the last six years he has served as western traffic manager at Seattle. Mr. Coman left the railroad service in January, 1913, to become vice president and general manager of the Northwestern Electric Co. at Portland, leaving that position in March, 1919, to become vice president and general manager of the Washington Water Power Co. at Spokane.

Mr. Winders entered the service of the Northern Pacific in August, 1905, as assistant attorney at Seattle, which position he held until August, 1910, when he became attorney for the company at Seattle. In 1922 he became assistant western counsel.

Mr. Burnham was born in 1882. He entered the service of the Northern Pacific as file clerk in 1907. He was promoted to various traffic department positions until made assistant general freight and passenger agent at Tacoma in 1926.

Mr. Norton was born in 1885. He entered the Northern Pacific service in 1908 as a clerk. Nine years later he was appointed traveling freight agent, later general agent, and for the last 18 months has served as assistant general freight agent at Seattle.

F. C. Smith has been appointed superintendent of the Ogden Union Railway & Depot Co. vice **G. W. Kellogg,** acting superintendent, who has been assigned to other duties. Mr. Smith formerly was assistant superintendent of the Southern Pacific at Ogden and **H. W. Wistner,** assistant superintendent of the Salt Lake division at Sparks, has been transferred to Ogden. **T. J. Foley** has been appointed to succeed Mr. Wistner at Sparks, and **J. J. Sullivan** has succeeded Mr. Foley as assistant superintendent of the Shasta division.

The appointment of **T. F. Joyce** as assistant vice president of the Boston & Maine, in charge of the railroad's public relations activities and of an enlarged industrial and agricultural development program, has been announced. Mr. Joyce joined the Boston & Maine

J. A. Edson

three years ago as assistant to the president in charge of publicity. In addition to his new duties he will continue to direct publicity and advertising. He announces the reappointment of **Col. A. N. Payne** as manager of the railroad's industrial and agricultural development bureau, and of **Albert D. Barker,** for many years a New England newspaperman, as assistant publicity manager.

J. A. Edson, president of the Kansas City Southern Ry. retired from that position January 1. Mr. Edson will remain with the road as "president retired." He has been succeeded by **Charles E. Johnston,** formerly vice president and general manager.

Mr. Edson, like many another executive in the railroad world, began his earning career as a telegraph operator, worked his way along the customary route of promotion—operator to dispatcher, chief, trainmaster, superintendent, and so on to the top. He started as an operator at 13 on the Lake Shore & Michigan Southern, now a part of the New York Central, and takes his new post as a retired president at 73. In the intervening years he has been with numerous roads, the Union Pacific, the Milwaukee, Missouri Pacific, St. Louis, Southwestern, Denver & Rio Grande Western, the Cincinnati, Hamilton & Dayton and others. He became president of the Kansas City Southern in June, 1905.

Mr. Johnston, the new president, came up through the engineering ranks. He is a young man, born in October, 1881, at St. Elmo, Ill. His first work was for the Chicago, Paducah & Memphis, later absorbed by the Chicago & Eastern Illinois. In this job, at the age of 16, he carried a chain and other things in the engineering department, later became an assistant engineer for the St. Louis-San Francisco; three years afterward, in 1903, was made a resident engineer for the Missouri Pacific, and then, in 1906, was appointed locating engineer for the Kansas City Southern. In 1917 he was made general manager, vice president in addition 1924, and remained in that position until his elevation the first of the new year.

Benjamin Campbell, vice president, in charge of traffic of the New Haven has been elected a director of the New York, Ontario & Western, to succeed the late **Charles F. Choate, Jr.**

Financial and Legal

E. O. Parks, auditor of disbursements of the Northern Pacific, retired January 1 under the pension rules after 46 years continuous service. He is succeeded by **F. W. Stetekluh,** assistant general auditor.

A. C. Simmonds, Jr., has been appointed assistant secretary and assistant treasurer of the Texas & Pacific, with headquarters at New York.

F. H. Millard, assistant to the president of the St. Louis Southwestern has been appointed comptroller and assistant to the president.

Frank H. Hamilton, vice president, secretary and treasurer of the St. Louis-San Francisco rounded out 40 years of service with that railroad January 2. Mr. Hamilton was graduated from the University of France at Paris in 1883, and began his railroad career as a general clerk in the office of the secretary-treasurer of the Frisco Lines in New York January 2, 1888. He moved to St. Louis as secretary-treasurer of the company on August 1, 1896, when the treasury department of the road came west, and has been a resident of St.

Louis since that date. He was made vice president, secretary and treasurer on June 1, 1921. During his railroad career Mr. Hamilton has been through two receiverships, and was treasurer for the government for the Frisco Lines during the period of federal control in the World War. His entire service has been in the treasury department.

Purchases and Stores

F. E. Cragin has been appointed general storekeeper of the Los Angeles & Salt Lake R.R. at Los Angeles succeeding **J. H. Cragin** who died in November.

Leon S. Myers has been appointed division storekeeper of the Northern Pacific at Tacoma, succeeding **Milton A. Cole** who has retired after 40 years service.

Traffic

Charles S. Fay, who will now assume the duties of traffic manager for both the Texas and Louisiana lines, with headquarters at Houston, by a coincidence of dates, also became identified with the Southern Pacific Lines in 1887, as clerk in the accounting department in New Orleans. As a result of these changes, **John T. Monroe,** general passenger agent of the Louisiana lines, will be appointed assistant traffic manager of System Lines, handling passenger matters and **S. G. Reed,** at present traffic manager of the Texas lines, will have the same position with the System Lines in Texas and Louisiana, handling freight matters. The present general offices in New Orleans are to be maintained with **R. C. Watkins,** vice president and general manager, Louisiana lines in general charge. **Joseph Lallande,** general freight agent, will have jurisdiction over freight traffic matters of Louisiana lines. A successor to Mr. Monroe as general passenger agent at New Orleans in charge of passenger matters will be appointed.

B. H. Taylor, assistant freight and passenger traffic manager of the Denver & Rio Grande Western, has been appointed general traffic manager with headquarters at Denver. **Frank A. Wadleigh,** passenger traffic manager, retired January 1 under the pension rules after serving the company for over 40 years. **H. I. Scofield,** general passenger agent, will have jurisdiction over the passenger traffic department. **W. W. Hatton** has been appointed assistant general passenger agent. The position of assistant to the passenger traffic manager has been abolished. **W. H. Cundey** is assigned to other duties.

John G. Meehan has been appointed general agent of the Chicago & Eastern Illinois at Jacksonville, Fla. vice **G. W. Ward,** transferred.

Robert R. Williams has been promoted to the position of assistant general freight agent of the Buffalo, Rochester & Pittsburgh at Pittsburgh vice **J. C. Gross** who has resigned. **R. W. Anderson** has been appointed assistant general freight agent at Rochester, N. Y. The position of division freight agent at that point had been abolished.

L. A. Burritt, assistant general eastern freight agent of the Erie, has been appointed assistant to the general freight agent, and **W. H. Stadelman** has been appointed to succeed him. **T. E. McAndrews** succeeds Mr. Stadelman as city freight agent, and in turn is succeeded by **A. R. Walton** as division freight agent at Jersey City. **C. E. Stober** has been appointed city freight agent at Brooklyn succeeding Mr. Walton. **L. R. Knapp** has been appointed general agent at Newark succeeding **H. B. R. Potter,** deceased.

Frederick J. Robinson, general passenger agent of the Central of Georgia, has

JORDAN SPREADER
"Does the Work of an Army of Men"
SNOW PLOW ★ ICE CUTTER ★ DITCHER
UNIVERSALLY STANDARD
O.F. JORDAN COMPANY
WALTER J. RILEY, PRESIDENT
EAST CHICAGO, INDIANA

Jordan-ize

Your ditch forming
material spreading
earth moving
ice cutting
snow fighting
and
Economize!

JORDANS aid proper drainage
Save time! *Save money!*

been appointed to the newly created position of executive general agent with headquarters at Atlanta.

Edward V. Murphy, general agent for the New Haven at Chicago, has been promoted to general western freight agent to succeed **Richard Hackett** who has resigned to engage in other business.

Frederick D. Claggett, assistant to the vice president of the Southern, has been appointed freight traffic manager of that road.

C. C. Prescott has been appointed live stock development agent of the Chicago & Eastern Illinois.

John W. Blount, assistant general passenger agent of the Central of Georgia, has been promoted to the position of general passenger agent.

John T. Lewis has been appointed assistant general freight agent of the Tennessee Central. Mr. Lewis was born in Canada and after several years with the Grand Trunk moved to the United States and became connected with the Erie. His service with that company covered a period of 19 years, during which time he held various positions, including that of agent at two of the large terminals. He entered the service of the Tennessee Central in February, 1911, as terminal agent at Nashville, which position he occupied until his present appointment. **W. B. Scruggs** has been appointed terminal agent at Nashville succeeding Mr. Lewis.

W. H. Stanley, Jr. has been appointed general passenger agent of the Tennessee Central with office at 414 Church street, Nashville.

Joseph Krone who has been in passenger traffic department of the Southern Pacific at Los Angeles for many years, has been appointed city passenger agent for the New York Central at Los Angeles.

Clement S. Ucker having resigned, the office of director of development of the Seaboard Air Line has been abolished.

J. N. McBride has been appointed general agricultural and land settlement agent of the Seaboard Air Line. The office of general agricultural agent has been abolished.

E. C. Spalding has been appointed foreign freight agent of the Canadian National, with headquarters at Vancouver, B. C.

C. K. Dunlap, traffic manager of the Texas lines of the Southern Pacific has resigned and will in future take up a more or less permanent residence in New York. He is succeeded by **Charles S. Fay,** traffic manager of the Louisiana lines. By his resignation, Mr. Dunlap severed a connection that has existed without interruption since 1887 when he entered the service of the Mexican International Railroad, one of the C. P. Huntington properties, as clerk in the material department. By degrees he was promoted, becoming traffic manager of the Texas lines in 1906. At the beginning of the federal control in 1918, he was appointed corporate president of the companies comprising the Southern Pacific lines in Texas and Louisiana. When these lines returned to their owners in 1920, Mr. Dunlap returned to the traffic post.

Mechanical

E. P. Marsh, has been appointed assistant superintendent of the car department of the Chicago & North Western and assigned to special duties. He is succeeded as superintendent of the car shops by **George E. Collins** formerly assistant superintendent.

Edwin O. Faulkner

Clarence H. Norton, master mechanic of the Erie at Hornell, N. Y., has been appointed shop superintendent at the same point, and **Charles J. Gerbes** has been appointed to succeed him as master mechanic.

J. O. Green has been appointed master mechanic of the Mississippi Central at Hattiesburg, Miss.

John H. Minette has been appointed general foreman of the Boston & Albany's locomotive shops at West Springfield succeeding **Joseph W. Murphy,** deceased.

L. M. Fry, road foreman of engines at Walla Walla on the Oregon-Washington R.R. & Navigation Co. has been appointed trainmaster of the first division, with headquarters at Portland.

Don Nott has been appointed assistant master mechanic of the Galesburg division of the Burlington.

The Pennsylvania has promoted the following enginemen to positions as assistant road foreman of engines; **W. E. Scripture,** assigned to Fort Wayne division; **C. L. Jourdan,** assigned to Logansport division; **E. P. Nolan,** assigned to Chicago Terminal division.

Alfred G. Hoppe, assistant engineer of tests of Chicago, Milwaukee & St. Paul, has been appointed engineer of tests.

Civil

R. L. Huntley chief engineer of the Union Pacific System having retired, **H. C. Mann** has been appointed to succeed him. **G. J. Adamson** has become assistant chief engineer of the Union Pacific R. R. and the St. Joseph & Grand Island Ry.

A. F. Stotler, district engineer of lines west of Ellensburg on the Northern Pacific has been appointed assistant chief engineer and engineer maintenance of way of the lines west of Paradise with headquarters at Seattle. He succeeds **A. R. Cook** who has retired after 26 years service. **G. I. Hayward,** district engineer of the lines between Paradise and Ellensburg, succeeds Mr. Stotler, and **H. M. Tremaine** assistant engineer of construction succeeds Mr. Hayward as district engineer at Spokane.

Moses Burpee, chief engineer of the Bangor & Aroostook, has retired from active service and been appointed consulting engineer. **P. C. Newbegin** has been appointed chief engineer.

R. R. Metheany has been appointed engineer maintenance of way of the southern division of the eastern region of the Pennsylvania succeeding **J. H. Cooper** who has been promoted.

R. M. Phinney, assistant signal engineer of the Chicago & North Western, has resigned to accept a position with the General Railway Signal Co. at Rochester, N. Y.

Raymond W. Davis has become roadmaster of the Fargo division of the Northern Pacific with headquarters at East Grand Forks, Minn. He succeeds **Patrick J. Carney** who has been retired on pension.

Alfred E. Perlman has been appointed roadmaster of the Dakota division of the Northern Pacific, vice **William S. McCarthy** transferred to Mandan, N. D., vice **Nels Anderson** transferred to the Yellowstone division.

J. M. Lee, supervisor of the Fort Wayne division of the Pennsylvania, has been transferred to Detroit, and **Phillip O'Connor,** track foreman, has been pro-

moted to succeed him at Upper Sandusky.

Andrew M. Lood, track foreman, has been promoted to the position of track supervisor of the Pennsylvania at Petoskey, Mich.

Obituary

Thomas O. Wood, purchasing agent of the Gulf, Colorado & Santa Fe, died December 10. Mr. Wood was 77 years old.

Sidney V. Rhymer, superintendent of telegraph and signal engineer of the Alton, died December 20 at Bloomington.

Henry M. Fickinger, formerly vice president and general superintendent of the Fort Worth & Rio Grande, died at Boulder, Colo., December 2.

David J. Redding, who retired not long ago as superintendent of motive power of the Pittsburgh & Lake Erie, died at his home December 8.

A. J. Archer, general agent of the Great Northern at San Francisco, died December 2 following an operation.

Silas W. DeWolf, vice president and general manager of the Texas-Mexican, died at Laredo, Texas December 3.

Edwin G. Merriam, who, until recently, was assistant to the vice president and general solicitor of the Missouri Pacific, died in St. Louis December 7. He was 76 years old.

W. A. Rooks, auditor of freight accounts of the Seaboard Air Line, died December 13.

James J. Ross, superintendent of telegraph of the Michigan Central, died December 26.

Charles M. Kittle

George A. Irwin, traveling freight agent for the Chicago, Milwaukee & St. Paul, at Los Angeles, died during December.

Charles M. Kittle, formerly senior vice president of the Illinois Central R. R., died at Chicago, January 2, after two weeks' illness. Since 1924 Mr. Kittle had been president of Sears, Roebuck & Co. He was 47 years old when he died.

Charles Kittle was born October 9, 1880, on a farm near Elkins, W. Va. His first railway work when 14 years old was that of water boy for a section gang. Later, when he was 17 years old, he was a station clerk for the West Virginia Central & Pittsburgh, now part of the Western Maryland Ry. He entered the service of the Illinois Central October 21, 1900, in station work. From 1901 until October 1, 1910, he was employed in various positions in the maintenance of way, mechanical, transportation and accounting departments. On the latter date he became freight claim agent. He served in that capacity until July 1, 1912, when he was appointed assistant to the president. November 29, 1916, he was elected vice president and January 5, 1918, first vice president. From June 8, 1918, to March 1, 1920, during the period of federal control of the railroads, he was federal manager of

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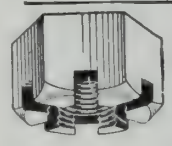
BRIDGEPORT, CONN.

ALSO U. S. S. SEMI-FINISHED AND U. S. S. SLOTTED NUTS



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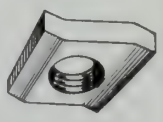
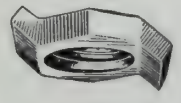


Square



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A "SAFETY" NUT LOCK

Apply with fingers till holding nut is met then wrench. Note time saved—material saved money saved—PIECE WORKERS like them.

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A "SELF-LOCKING-NUT"

Standard sizes and dimensions. Easily applied without waste of time or injury to threads. CANNOT shake loose. FREIGHT CARS all over the country have them on. They have stood the test of years.

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Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
COLUMBUS, OHIO

the Illinois Central, the New Orleans Great Northern, the Mississippi Central and the Gulf & Ship Island railroads. He was elected senior vice president March 1, 1920.

Gen. Charles Miller, 84 years old, one of the founders of the Galena Signal Oil Co., died at his home in Franklin, Pa., December 20. Until eleven years ago General Miller was president of the Galena Company, and at the time of his death he was president of the Lake Erie. Franklin & Clarion R.R., the Franklin Railway Oil Co. and the General Manifold Printing Co.

L. E. Lynde

Edwin Ogilvie Faulkner, vice president of the Santa Fe Land Improvement Co., the Chanslor-Canfield Midway Oil Co., the Westport Tie Co., and prominently connected with many other large California enterprises, died December 17. Mr. Faulkner who was 77 years old was born in Forfar, Scotland, came to New York when about 21 years old, and went to Canada, where he became superintendent on the government railways. He returned to the United States while still a young man, and as an early pioneer in the Dakotas, helped materially in the development of that country long before the railroads were built into it. When James J. Hill began his spectacular construction of a railroad across the upper part of the states, Mr. Faulkner became his confidential assistant. This work led to his becoming assistant to the president of the Santa Fe Railway. He continued in that capacity until the retirement of its late president, E. P. Ripley, with whom he was closely associated during his entire career. The railroad interchange of cars, which has done much to facilitate the handling of freight traffic, and the use of wood preservatives, which has reached a stage where it saves railroads throughout the United States hundreds of millions of dollars annually, are practices said to have been originated by Mr. Faulkner, and carried to a high state of development under his personal direction.

George A. Price

Mr. Faulkner's death is understood to be due to age, rather than any specific ailment, as he is said never to have been confined to his bed by illness in 50 years or more until he went to the hospital for a rest from over work, and not because of any feeling of illness, shortly before his death.

Supply Trade Notes

J. E. Lewis, president of the Harbison-Walker Refractories Co. of Pittsburgh, has been elected a director of the American Arch Co. The American Arch Co. holds a substantial stock interest in the Harbison-Walker Refractories Co. and it is believed that the former will soon have representation on the Harbison-Walker board.

Percy C. Brooks of New York has been elected a vice president of **Fairbanks, Morse & Co.**

L. E. Lynde has been appointed manager of the transportation division of the Boston office of the **Westinghouse Electric & Manufacturing Co.** Mr. Lynde has been with the Westinghouse Company since 1920, and during the past several years has been in its New York office engaged in transportation activities. He succeeds **H. S. Day**, who recently resigned to become superintendent of equipment for the United Railways Co. of Providence.

Van Cortright Mekeel, formerly connected with **Taylor-Wharton Iron & Steel Co.** of High Bridge, N. J., in capacities of special research investigator, mechanical engineer and sales engineer, has resigned to accept a post as special representative of the **Nugent Steel Castings Co.**, Chicago.

George W. Smith, Jr., formerly technical assistant to the vice president and general manager of the **White Motor Co.**, has been promoted to the position of works manager. Mr. Smith succeeds **R. M. Hidey**, who has resigned.

George A. Price, secretary and treasurer of the **American Arch Co., Inc.**, 17 East 42nd street, New York, was elected executive vice president on November 28. Prior to entering the employ of the American Arch Co. Mr. Price was in the motive power department of the New York Central. In March, 1918, he was elected assistant secretary of the American Arch Co. and subsequently became treasurer and assistant secretary

James Charles Bennett, comptroller and secretary of the **Westinghouse Electric & Mfg. Co.**, has been elected a vice president. In his new position he will have general charge of the accounting and treasury departments. In length of service Mr. Bennett is one of the oldest employes in the Westinghouse Electric group, he having been employed by the Westinghouse Electric Company in 1886 five months after that company was formed.

Harvey Hubbell, president and treasurer of **Harvey Hubbell, Inc.**, Bridgeport, Conn., died December 17. His son, **Harvey Hubbell, Jr.**, who has been associated with him in the company, has been elected to succeed him.

W. J. Walsh, vice president of the **Galena Signal Oil Co.**, at Chicago, has resigned to become president of the **Transportation Service Corpn.**, Chicago.

in June, 1920, and treasurer and secretary in January, 1926.

C. J. Buck has been appointed service manager of the **Franklin Railway Supply Co.**, New York, succeeding **John L. Bacon**, who has resigned to enter business for himself. Prior to 1918 Mr. Buck was engaged as a machinist and inspector in the automobile industry. In March, 1918, he entered the railway supply business with the Franklin company, as inspector in charge of the testing department on car lighting equipment. In 1919 he went with the J. Stone Company in the same capacity, but returned to the former company in June, 1920, in the locomotive department as inspector at the locomotive builder plants. On January 1, 1923, he was promoted to the position of chief inspector, having supervision of the inspection of all Franklin equipment and its application at the plants of the various locomotive builders, which position he has held until his promotion to that of service manager. Mr. Buck will be in charge of a work with which he is entirely familiar, since he has been closely associated with the operations of the service department ever since his promotion to chief inspector five years ago.

Charles L. Butler has been appointed manager of railroad sales for the **Goodall Rubber Co.**, in the Chicago district, with offices at 117 North Wacker drive. Mr. Butler formerly represented the Detroit Lubricator Co.

A. J. Brosseau, president, Mack Trucks, Inc., has been appointed chairman of the motor truck committee of the National Automobile Chamber of Commerce, and has also been elected vice president of the commercial car division of the automobile chamber. He succeeds in both these offices, **Windsor T. White**, formerly chairman of the board of the **White Company**, who had held these offices since the organization of the chamber. Mr. Brosseau is vice president of the U. S. Chamber of Commerce.

C. J. Buck

Charles W. Bell has been appointed general sales manager of the **Gould Storage Battery Co., Inc.**, with headquarters at Depew, N. Y., and **L. C. Hensel** has been appointed manager of railroad sales with headquarters in New York. **P. J. Linnekin** has been appointed assistant to the manager of railroad sales. **A. M. Anderson** has been made sales engineer in charge of railroad sales in Chicago, and **A. J. Davis** has been made railway sales representative with headquarters in New York.

W. Homer Hartz, treasurer of the **Morden Frog & Crossing Works** of Chicago, has been elected vice president and general manager of sales, succeeding **Arthur C. Smith**, who died recently.

H. W. Kilkenny, representative of the **Ohio Brass Co.** in the Pittsburgh district, has been transferred to the St. Louis district, and **S. W. Walworth**, formerly with the **Pittsburgh Transformer Co.**, has taken charge of the Pittsburgh territory.

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

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This advertiser is now handling an outstanding account—has for years—very successfully, and can serve another advantageously to us both. Address B, C/O TRANSPORTATION, 1633 Monadnock Block, Chicago, Ill.

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Send us your specifications

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Pittsburgh — New York — Chicago — Baltimore

Just Completed—the Outstanding Success of the City

THE BELVEDERE HOTEL

48th Street, West of Broadway, New York City

Times Square's Finest Hotel—Within convenient walking distance to important business centers and theaters. Ideal transit facilities.

450 ROOMS —— 450 BATHS

Every room an outside room with two large windows; large single rooms size 11x6x20 with bath, $4.00 per day; for two, $5.00—twin beds, $6.00. Large double rooms, twin beds, bath, $6.00 per day. Special weekly rates. Furnished or unfurnished suites with serving pantries, $95 to $150 per month.

Moderately Priced Restaurant featuring a peerless cuisine.

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WITH A RAILROAD WHOSE EARNINGS
DECREASE IN BAD WEATHER

A BAD RAIL IS NO EXCUSE FOR UNDERLOADING. SUCH EXCUSE REPRESENTS NEGLECT, SHORT-SIGHTEDNESS OR MIS-INFORMATION IN SOME DEPARTMENT. CORRECT THE RAIL CONDITION INSTEAD OF ADJUSTING THE LOAD

GRAHAM-WHITE
SANDERS DELIVER SAND UNIFORMLY REGARDLESS OF RAIL OR WEATHER CONDITIONS. USE THEM AND LOAD YOUR POWER TO CAPACITY AT ALL TIMES

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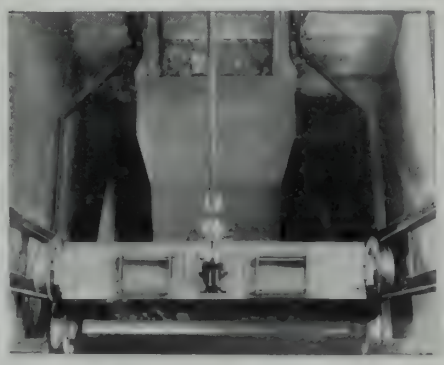
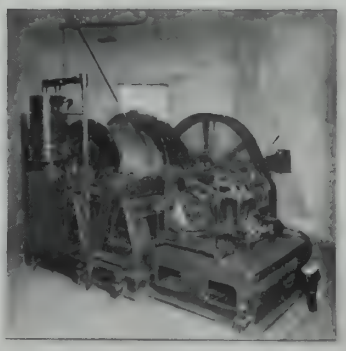
ROANOKE, VIRGINIA

COALING PLANTS





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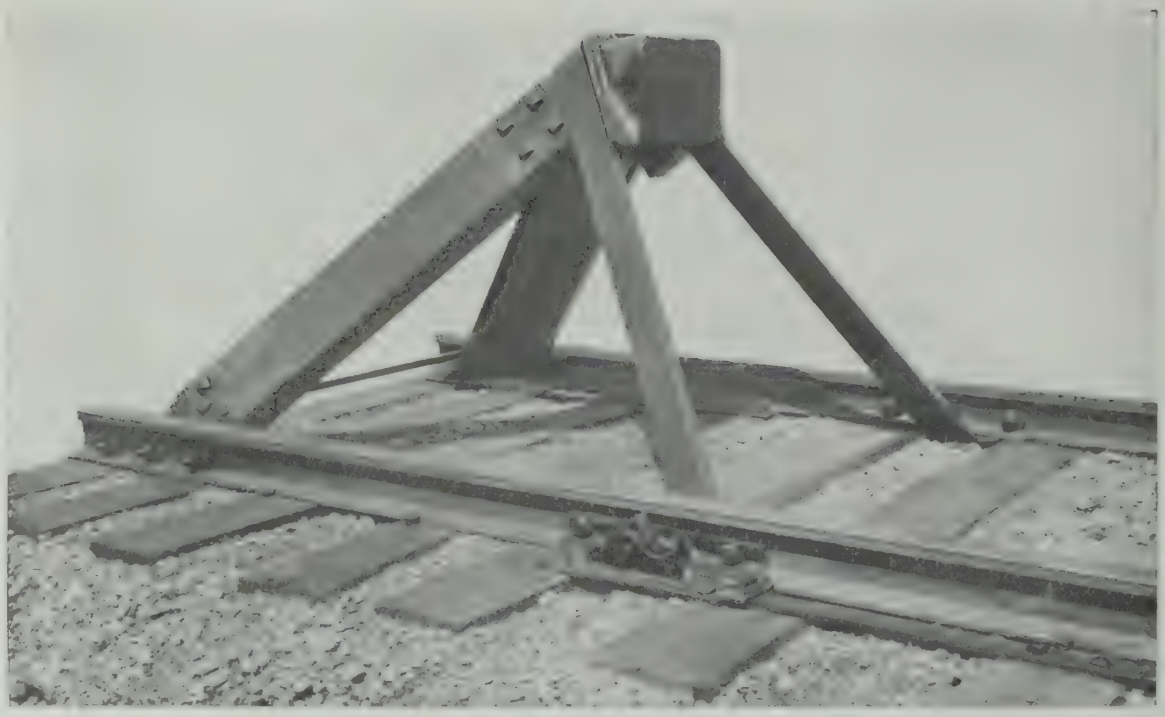
CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industry

Vol. II February, 1928 No. 2

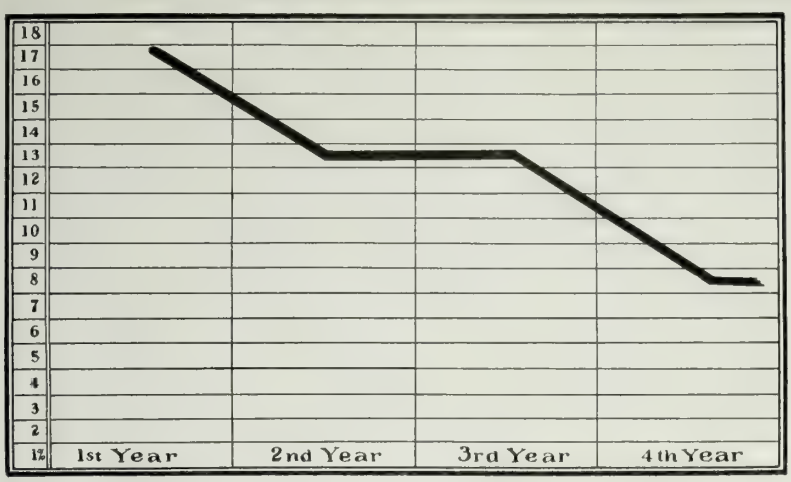
Hayes



When you buy a Type W post for a track you are through buying posts for *that* track.

We base this statement on the fact that with 1400 Hayes Type W Bumping Posts put in track during 1925, '26 and '27, not one has been destroyed and scrapped.

Hayes Track Appliance Co., Richmond, Indiana



Reducing Truck Lever Connection Purchases From 17.8% to 8.2%

IT is gratifying to watch the decrease in annual purchases when a road adopts Schaefer Truck Lever Connections. (Not so gratifying to us you might think, but it is, because we drop forge Schaefer Truck Lever Connections to insure longer service and fewer renewals).

During the first year that a certain prominent road used Schaefer Drop Forged Truck Lever Connections their purchases totaled 17.8% of their equipment.

In the second year purchases dropped to 13%.

In the third year, it was 13.3%

In the fourth year it was 8.2% and it has been around 8% or less ever since.

Records of truck lever connection purchases by 50 roads over a period of 12 years show that the adoption of Schaefer Drop Forged (weldless) Truck Lever Connections reduces renewals 50% or more.

We have some interesting figures on the reduction of truck lever connection costs on a number of prominent roads.

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Transportation

The Monthly Magazine of the Transportation Industry

FEBRUARY, 1928

VOLUME TWO NUMBER TWO

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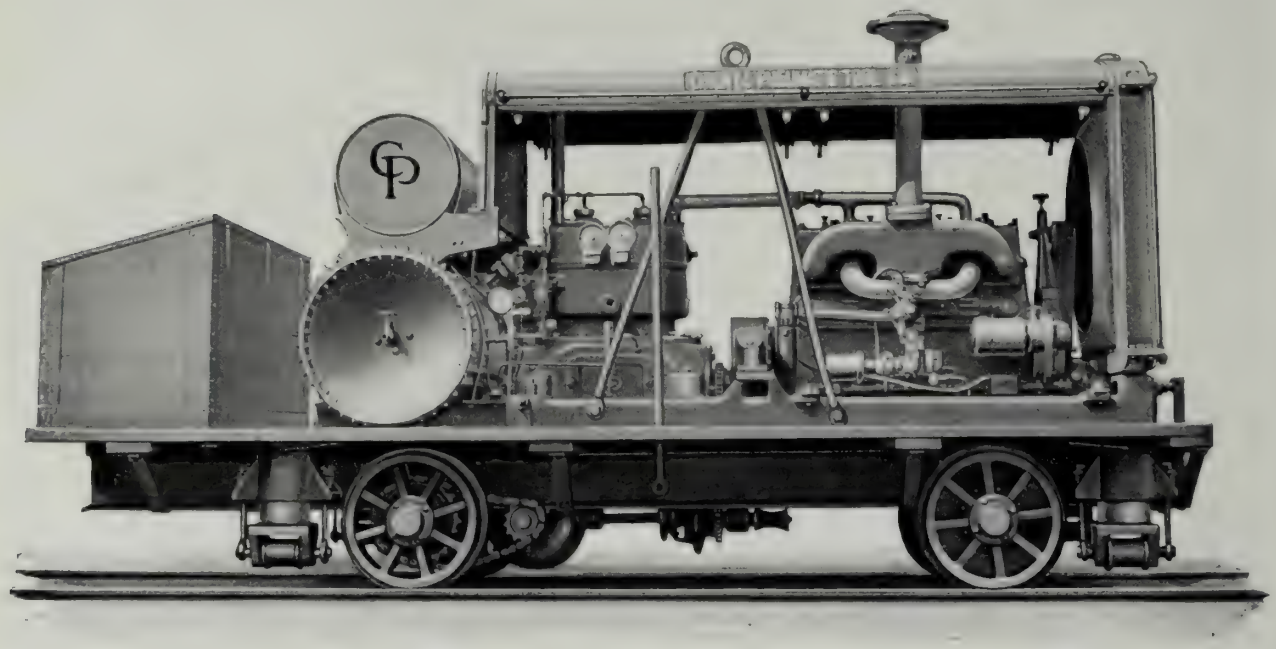

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A New CP Compressor Car for Railroad Service

OUR many years' experience in building air compressors of all types has been combined with the practical suggestions of experienced railroad men who have assisted in the design of this new complete unit. It is built in sizes of 100, 160, 220 and 310 cubic feet per minute displacement. The standard CP gasoline engine driven portable compressor with its famous Simplate Valve, Auto-Pneumatic throttle and other exclusive features, is mounted on a truck frame carrying flanged wheels with Timken roller bearings, transverse shifting wheels, a transverse towing winch and air operated lifting jacks. The car is propelled at a speed of 12 to 18 miles per hour, depending upon the size. These and other interesting features of this latest CP development are illustrated and described in Bulletin No. 789, which will be sent upon request.

C-279

Chicago Pneumatic Tool Co.

Railroad Department

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New York

310 So. Michigan Ave.
Chicago

The Rehabilitation of the D. & R. G.

Millions for Better Track

By W. R. Welby

THE assurance that after taking a very disagreeable remedy he is going to feel a whole lot better never has stirred up much enthusiasm in the heart of an ailing boy. Security owners of the Denver & Rio Grande Western should understand the homely simile. They have had several extremely distasteful doses to swallow in generations past, and they never have set up any rousing cheers over the treatment. Their road ran through a region beautiful and awe-inspiring as a marvel of engineering but the more business it hauled over the precipitous mountains the more the costs of transportation grew, for the grades were expensive in power, and the curves, while lending much to the atmosphere of anticipation for the sight-seeing tourists, certainly lent mighty little to the net return.

But the Denver & Rio Grande Western security owners have a chance now, and a pretty good one, too, of getting something for their efforts besides the good opinions of grateful travelers. They have had to accept the unpleasant theory that the only way to earn money with a railroad is first to spend money in making it better, in making it possible to operate less expensively by putting millions into improved roadbed, reduced grades, straighter track, better equipment. They have been doing these things for three years now, and the road, under the efficient management of J. S. Pyeatt, is about ready to take any traffic offered it, and moreover to handle it promptly and properly.

The famous scenic route certainly has undergone a drastic rehabilitation under the program of improvements adopted three years ago. These improvements included the elimination of heavy curvature in canyons, reduction of grades, installation of steel or concrete bridges and culverts and new ties, laying of new and heavier rail, distribution of ballast, and the erection of safeguarding signal devices which silently and automatically keep constant vigilance over moving trains.

What is it all for? Just this: The Denver & Rio Grande Western is being operated under a policy of maximum service to the public—the limit of safety, convenience and speed—and expeditious handling of traffic, freight and passenger, all commensurate with wisdom and a reasonable regard for those whose money is invested in the property.

In 1927 the total cost of reducing curves and changing alignment was about $2,000,000. This work has been completed or is under way in the following localities:

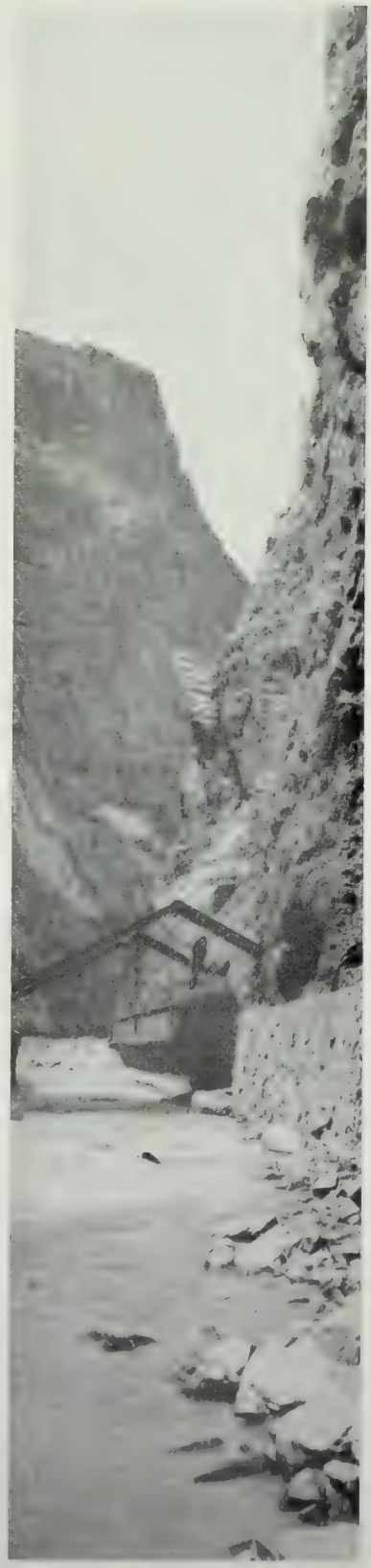
Between Husted and Pikeview, Colo., where the curvature is reduced from 6 degrees to 2 degrees.

Between Parkdale, the first station west of the Royal Gorge, and Salida, Colo., where the curvature has been acute, reduction is being made from 12 degrees to a maximum of 6 degrees. To accomplish this it has been necessary to change the channel of the Arkansas River in a number of places.

In the Brown Canyon, west of Salida, Colo., the curvature is being reduced from 10 degrees to a maximum of 6 degrees.

On the east side of Tennessee Pass the curvature has been reduced to a maximum of 6 degrees.

When this work is completed



Hanging Bridge, Grand Canyon of the Arkansas, D. & R. G. W. Ry.

there will be no curves over six degrees in the territory Parkdale to Tennessee Pass, Colo., a distance of approximately 110 miles.

Between Minturn and Eagle, Colo., the changes will result in a maximum curvature of 6 degrees, and between Mack, Colo., and Westwater, Utah, through Ruby Canyon, the curves will be reduced to a maximum of 4 degrees.

Between January 1 and December 31, 1927, there was laid on the main line 132 miles of 90-lb. and 100-lb. rail.

A total of 62 miles of slag ballasting in Colorado and 28 miles of gravel ballasting in Utah was completed in November.

Automatic signals are being installed between Minturn and Palisade, Colo., a distance of 135 miles, of which 102 miles are now completed and in operation.

It took money, barrels of it, to do these things—about $700,000 a month, and in the year about $9,000,000 was spent. In the three years just ended the company has put about $23,000,000 into making a better, bigger, more efficient railway out of the D. & R. G. W.

In doing this work—getting down to details—the company used:

Gas and steam shovels, 30; Drag lines, 3; Ditchers, 11; Clam shells, 5; Concreting outfits, 8; Pile drivers, 4; Dinkey trains, 2; Teams, approximately, 100; Work trains, 19; Extra gangs, 27; Contractors' camp outfits, 30; Approximate number of men employed, 4500.

Ruby Canyon, West of Grand Junction; Line and Grade Change. X Marks the Roadbed for New Line.

To care for the necessary men and materials 150 bunk and dining cars were used. An unknown number of air dumps, tool cars, and material cars had to be provided, and they were on the job when wanted.

While these things were being done the equipment needs were getting attention. In August ten new Mallet locomotives, each weighing 974,000 pounds, with a tractive effort of 125,000 pounds, were delivered. Ten new standard gauge cabooses were built at the company's shops at Burnham, Colo. Four new modern, steel dining cars were delivered in June. Three hundred new 50-ft. 50-ton automobile cars were placed in service during the summer.

But this isn't the end of it. You have to keep right on forever spending money on a railroad if you hope to take out anything except tax receipts. In 1928 the company will spend about $5,500,000. Of this amount, roundly $1,500,000 will be chargeable to operating expenses, the balance constituting capital improvements chargeable to road and equipment account. The principal budget items are $1,600,000 for rail and other track material, about $900,000 for bridges, trestles and culverts, $750,000 for changes of grade alignment, $575,000 for additional block signals, $500,000 for yard tracks, sidings and industrial track, and $200,000 for ballasting.

Provision also is made for improving locomotive water supply facilities. The road's supply of equipment is ample, and only a nominal expenditure for this account will be made. Treasury cash and income from operations in 1928 should be sufficient to pay

One of the Ten New Mallet Locomotives Built for the Denver & Rio Grande Western by the American Locomotive Co.; Delivered Last August.

for these improvements it is said.

The progress of this work is especially significant to Denver & Rio Grande Western security holders. As soon as improvements are established on a normal basis, it should be possible to reduce operating costs very materially, so that net operating income will reflect more truly the real earning power of this road.

All these improvements, President Pyatt said recently, totalled more than it cost originally to build the road. Indeed in seven years the D. & R. G. W. has spent 42 million dollars in attaining physical perfection of roadbeds, trackage and equipment.

Salida-Cameron North Side of Track Facing West at Mile Post 180.8 Showing Channel Change and New Fill.

The Railroads as Taxpayers

As long as the railroads have to pay out for taxes more than five per cent of all they take in, they are not likely to be able to make considerable reduction of any kind in their rates.

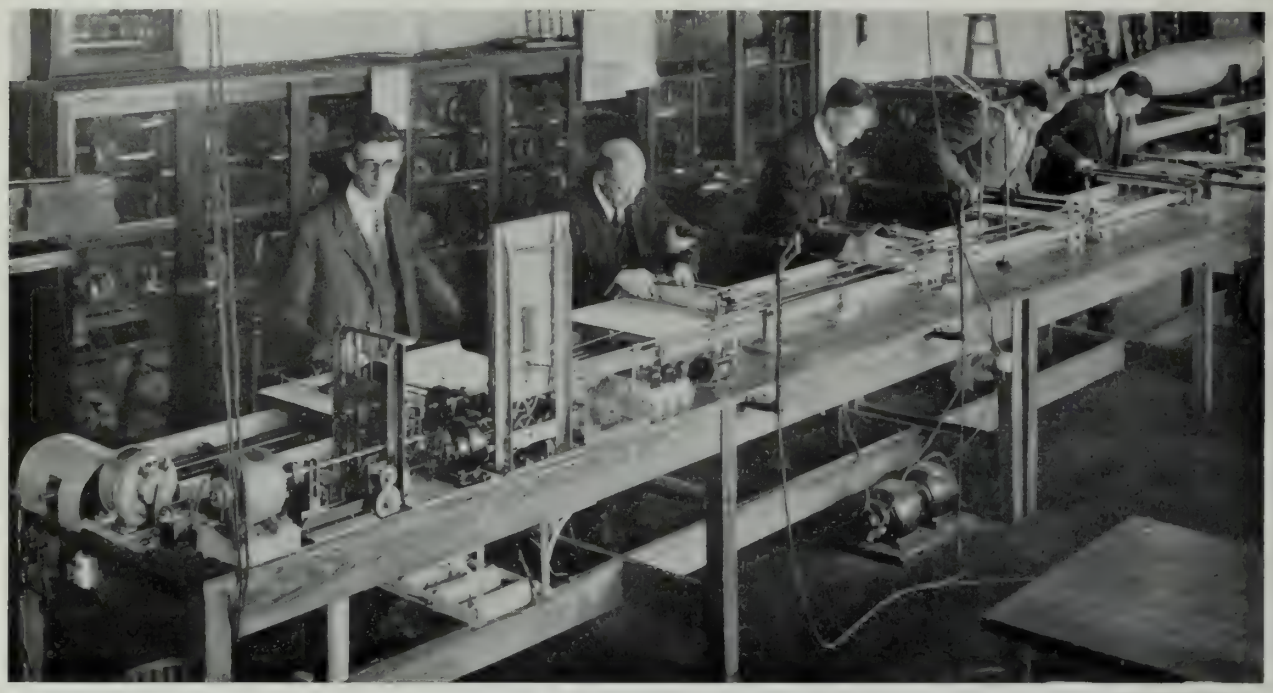
For five years they have paid more taxes than dividends, as their 640,000 security holders know to their sorrow. Three-fourths of the railroad tax burden is paid to state and local governments throughout the country.

The railroads are deeply interested in efficient and economical government on tax grounds, if for no other reason. Out of every $10 paid in taxes to local and municipal bodies throughout the country, $2 is going to pay interest and sinking fund charges on public debt.—Philadelphia (Pa.) Bulletin.

Line Change Near Wolcott, Colo. Dotted Line Indicates New Alignment. This Work Involved a 60,000-Yard Fill and a 32,000-Yard Cut.

Cooperating Willingly And Paying a Part

It might be pointed out also that if railroad companies were mere "soul-less corporations" they would not feel themselves compelled to pay a share of the cost of grade crossing elimination, inasmuch as they could not be held for damages in crossing deaths. But railroad companies are cooperating willingly in eliminating crossings, not merely for their own convenience but for humanity's sake.—Albany News.



—Wide World Photo

This is the Wonderful Integraph, Devised to Save the Minds and Time of Tired Engineers.

Here's the Thinking Machine

Welcome news for the civil engineers provided they don't object to trying out new fangled notions —the mechanical thinking machine. And this one is a real marvel. The world is so accustomed to the developments of science that it takes something pretty unusual to stir up much interest.

The new invention, which has been developed by Dr. Vannevar Bush of the Massachusetts Institute of Technology, with the assistance of H. L. Hazen, H. R. Stewart, F. G. Kear, F. D. Gage and others, is an electrical apparatus which is said to solve very quickly problems in mathematics which would require the concentration of a trained human brain for months.

It is called the product integraph, and, says Dr. Bush, "might be called an adding machine carried to an extreme in its design. Where workers in the business world are ordinarily satisfied with addition, subtraction, multiplication and division of numbers the engineer deals with curves and graphs which represent the past, present and future of the things with which he deals."

A watt hour meter is the foundation of the product integraph. The engineer takes the equations with which he is concerned and plots them on sheets of paper which are passed under pointers. As the pointers move along the curves the power flows in varying proportion through the meter, and the meter controls a motor which drives a pencil on another sheet of paper. This pencil traces a curve which gives the desired result. There is a second device, differing somewhat from the first, which integrates the result a second time.

Dr. Bush is 37 years old and is professor of electric power transmission at M. I. T. During the war he specialized on submarine detection devices for the navy.

Run Trains By Battery

Word came from London not long ago that an electric accumulator, stated to be powerful enough to drive an express train over a long distance on any existing track without a third rail or overhead wires, is being secretly tested in London.

The accumulator, or storage battery, is the invention of a Spanish Jesuit priest, Father Almeida of Salamanca, who is backed by a group of prominent British financiers. The device also can be used on automobiles, which foreshadows the possibility of its revolutionizing every form of transportation.

The company has been formed to develop the invention, but its directors have refrained from advancing claims for it until its success is demonstrated.

Changes Traffic Plan

Austria has adopted the right-hand system of traffic regulation. It is estimated that the cost of changing traffic laws from left to right will be about $2,000,000, and it is expected that the system will be fully installed by 1930.

It's all right to be clever, but the kind of cleverness that the boss likes is to do the job in a little better style than it has been done.

Columbus Discovers the Frisco

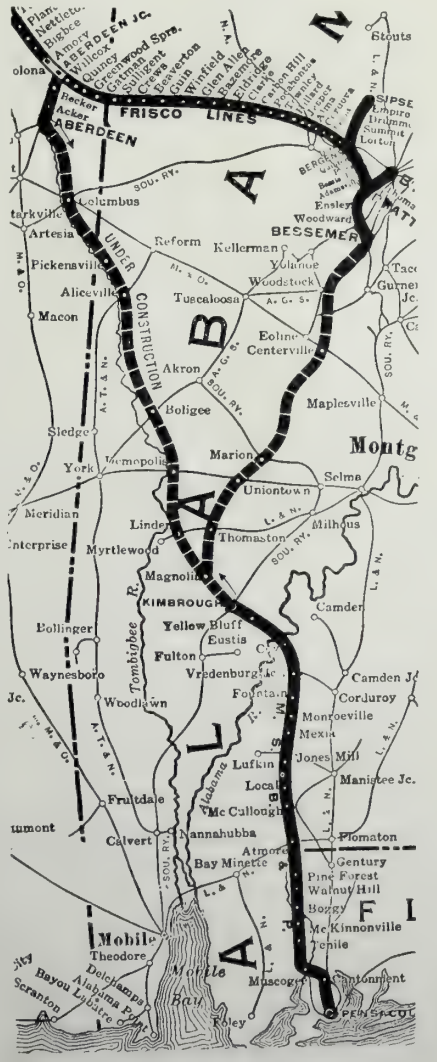
Mississippi Welcomes A Train

By W. J. Sparks

NOBODY likes to live in a railroadless town. Automobiles are all right in dry weather, and trucks have become a necessary part of transportation as feeders to steam lines, but forward-looking Americans do welcome a railroad as in the days of long ago. This was pretty effectively shown in December, when the Frisco Lines completed the first part of the connection between that property and the M.S.B.&P. Ry. — Muscle Shoals, Birmingham & Pensacola — acquired in 1925. Ultimately the Frisco will have a tidewater terminus at Pensacola, an extremely important facility.

The M.S.B.&P. runs straight north from Pensacola to Kimbrough, Ala., and 149 miles north of this place is Amory, Miss., an important point on the Frisco's main line between Memphis and Birmingham. Columbus, Miss., with its State College for Women and an enrollment of 1500, is one of the important cities served by the Frisco on its way to the gulf and Columbus has been mightily stirred up over the new line. It means much to its future prosperity. Heretofore, girls going to college at that point, have had to take a "Seeing the South" journey, or a good many of them anyway, picking up a lot of geography on the way, and arrived in Columbus unfit for anything except the rushing parties.

All this is changed now, and the people are happy. At least they acted that way when the first Frisco train pulled in at the partly finished station—a $50,000 structure —December 16. It wasn't actually the first train, understand. There had been a freight or two into town some time previously, but freights, the people knew, have to be paid for, while a passenger train symbolizes the railroad company's generous contribution to the general welfare and convenience, the all-round uplifting of the national conscience—hoping you get the idea.


ABERDEEN JC.
FRISCO LINES
ABERDEEN
Columbus
Artesia
Pickensville
Aliceville
Macon
Reform
Kellerman
BESSEMER
Woodstock
Tuscaloosa
Eoline
Centerville
Akron
Boligee
Sledge
York
Marion
Selma
Uniontown
Meridian
Linden
Thomaston
Enterprise
Myrtlewood
Magnolia
KIMBROUGH
Yellow Bluff
Eustis
Bellinger
Fulton
Waynesboro
Vredenburgh
Woodlawn
Camden
Corduroy
Monroeville
Mexia
Jones Mill
Lufkin
Fruitdale
Calvert
Mc Calloughs
Plomaton
Century
Pine Forest
Walnut Hill
Mc Kinnonville
Mobile
Theodore
Muscogee
Cantonment
Foley
Mobile Bay
Bayou Lubatre
Scranton
Stouts
Woodward
Ensley
Tacoma
Gurnee
Maplesville
Montgomery
Milhous
Camden Jc.
Manistee Jc.
Tombigbee
Alabama
Tensaw
Tanner
Tombigbee
Alabama Pt.
Delchamps
Bay Minette
Atmore
Bay Minette
Tensaw
Tanner
Tombigbee
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Tensaw
Tanner
Tombigbee
Alabama
Tensaw
Tanner
Tombigbee
Alabama

This Is a Picture of the First Frisco Train Into Columbus, Miss., Officials, City, State, and Railroad. The Gentleman At the Extreme Right Is Vice President Koontz Wearing His Public Relations Smile.

ger traffic manager; Col. F. G. Jonah, chief engineer; John W. Nourz, general passenger agent; W. L. Huggins, director of publicity, all of St. Louis; R. E. Buchanan, executive general agent; A. P. Matthews, assistant general passenger agent; R. E. Gabriel, assistant superintendent, all of Memphis; Judge D. W. Houston, Sr., and Jr., of Aberdeen; Mayor Acker of Aberdeen and Hugh Whitlow, district colonization agent of Columbus.

The Frisco put on another show in December, this time at St. Louis, when the new fast train, "The Bluebonnet," pulled out for Texas. The new train, named for the state flower of Texas, runs to San Antonio, and is a companion train to the famous Texas Special. Leaving St. Louis daily at 2:05 p.m., the train arrives in Dallas at 8:30 a.m. the following morning, Fort Worth at 8:45 a.m., Austin at 3:20 p.m. and San Antonio at 5:55 p.m. Returning, the train arrives in St. Louis at 8:05 a.m.

The equipment consists of an observation car, Pullman sleepers, diner, chair car, coach and baggage-express cars, and is drawn by huge mountain type oil burning locomotives. The illuminated rear sign includes a reproduction of the flower, the bluebonnet, adopted formally by the legislature as the state flower of Texas. If you are scientifically inclined you may not recognize the name. In your class it is called Lupinus texensis, but don't worry. In other less select company the bluebonnet is known as Buffalo Clover. It is said to be related to the Scottish blue-bell; none of which may get a thought from the fortunate passengers on the Frisco's new train.

Forest Products

According to the United States department of agriculture, the railroads last year spent $1,559,032,331 for fuel and supplies, of which 12 per cent ($186,291,234) went for lumber and other forest products.

The purchases included 93,000,000 crossties at a cost of $101,000,000.

Spades Still Trumps on S. P.

The common shovel still is so important in railroad affairs that salvage of broken shovels last year netted the Southern Pacific a saving of nearly $5000, according to A. S. McKelligon, general storekeeper for the company.

Last year this company issued 38,604 shovels. Of these, 2570 dozen were new and 690 dozen salvaged. The value of the salvaged and repaired shovels was more than $11,000 but the cost of reclaiming was slightly over $6000, so that the net saving on shovels issued during the year was about $5000. As a matter of fact the company salvaged over 733 dozen shovels, and the total savings for the year, including shovels still in stock was $5755.

Travel in Early Days

Travel, in the past, was a luxury which only the very rich could afford. The majority of men and women were born, lived and died in the same place. They inhabited a universe ten miles wide; beyond its borders lay the unknown. Today even the poor can take small journeys; the moderately prosperous are familiar with whole continents. The mind is nourished by its impressions from without; to enlarge one's physical world is to enrich one's mind. Machinery, in the form of transport, is providing for larger and ever larger numbers of human beings a form of liberal education.—Aldous Huxley in August Harpers.

About 45 pounds of coal per hour is required to keep a locomotive under steam in the enginehouse.

Little Drinking Among Trainmen

What Railway Executives Say

By Charles Dillon

SPEAKING to the Bankers' Club of New York at 120 Broadway, one day in October, J. N. Gibbons, general counsel for the New Haven railroad, was quoted by newspapers as saying that since the prohibition law was enacted railroad accidents had increased about 40 per cent. This indicated to Mr. Gibbons's mind not that more alcohol is being used now than before the much discussed law arrived, but that it actually never had played an important part in causing accidents. Without trying to reconcile Mr. Gibbons's two statements, which do seem a bit paradoxical, this magazine asked a number of the principal railroad executives for their opinions.

Because of the extremely controversial character of the subject several of these executives declined to be quoted. But with few exceptions they started investigations among their general managers who took it up with the division superintendents who carried it to the trainmasters, the foremen of this and that department, the final result being a most interesting dissertation on the question of drinking. Out of this comes the conclusion that regardless of what fanatics may say on either side of the debate, it is quite clearly apparent that old Rule G is very strictly in force on America's railroads, and that Mr. Gibbons's 40 per cent estimate fell into an air pocket.

Of course, it must be admitted, accidents have increased on highways and at grade crossings in the last few years. No one denies this; but only a few persons blame the prohibitory law for the fact, and even these are not bold enough to argue that whisky, before prohibition, ever made a driver more competent to succeed in a contest with a locomotive at a crossing.

But whatever it is that has brought about the wave of recklessness among certain classes of motorists, it is not necessarily a part of this chronicle. We are interested in the moral state of railroad men, and in the effect upon the public mind of having it generally known everywhere that these men are not drunkards, that they have a very grave recognition of the responsibilities placed upon them in train operation, and that they know—from call boys to the top of the line, that violation of Rule G means dismissal. This is not an argument for or against prohibition as a force for moral stability and domestic peace and prosperity.

Are there more accidents now on railroads than in the old and so-called care-free days—remembering if you please, that drinking in this industry has been prohibited for more than 40 years—?

"The figures which I have been able to gather," says President Storey of the Santa Fe System, "do not bear out the statement of Mr. Gibbons. According to the best information I can get the reverse is the case. Comparative figures for reportable steam railroad accidents of all kinds for 1919 and 1925 are shown in the table accompanying this article.

On Time, Always Ready for Duty, and With a Clear Head.

"On our own railroad the total number of accidents to employes was as follows:

1919		1925	
Killed	Injured	Killed	Injured
66	12,185	40	7,055
Percentage of Dec.		39.3%	42.1%

"This decrease was in the face of an increased car mileage of 25.6 per cent. Herewith are figures furnished me by the bureau of railway economics for casualties to employes in train, train service, and non-train accidents in the United States on all steam railways for the years indicated.

Year Ended	Killed	Injured
June 30, 1913	3,715	171,417
1914	3,259	165,212

"In averaging the seven years prior to the Eighteenth Amendment the annual average number of railway employes killed was 2,975 and in the seven years 1,786, a decline of 40 per cent. The annual number injured for the two periods was 158,989 and 125,505, respectively, a decline of 21 per cent. You will note that the percentage of decrease in the number killed is the same as the increase stated by Mr. Gibbons.

"Personally, I do not believe the Prohibition Act is responsible

for the decrease in accidents or that it has any relation to it, but is due to efforts made by the railroads to educate their employes in the matter of safety habits. During the particular time under discussion there has been a very extensive campaign waged in this direction.

"Possibly you know that long before there was a Prohibition Act the railroads discouraged drinking on the part of the employes and practically prohibited it so far as train and enginemen were concerned. Possibly it has been a little easier to enforce our rule since prohibition than it was prior thereto, but we still have considerable trouble on parts of our system, especially where we are within reach of the border, from which bootlegging operations can be conducted."

The president of a southern railroad says:

"Wholly apart from any question as to the wisdom and propriety of prohibition as a national policy, I have no hesitation in saying that, in my opinion, there is much less drinking among railroad employes than there was before the adoption of the prohibition amendment and the passage of the Volstead law. If this be true, it must have had its effect in increased efficiency on their part. I assume there is secret drinking among railroad employes just as there is among all classes of our citizens, but, as indicated, I do not believe there is as much drinking among railroad employes as there was in the pre-prohibition days."

The president of a very important eastern railroad wipes out the whole question with one gesture. He sends a copy of Rule G. If, perchance, some railroad man has forgotten the wording of this famous ukase, here it is:

The use of intoxicants by employes while on duty or subject to call is prohibited. Their use by any employe, or the frequenting of places where they are sold, is sufficient cause for dismissal.

"This rule has been in effect on our line for a great many years," says this gentleman.

Reportable Accidents on Steam Railroads in Two Years

	1919		1925	
	Killed	Injured	Killed	Injured
Employes	2,138	131,018	1,594	118,874
Total	6,978	149,053	6,766	137,435

Casualties to occupants of automobiles in highway grade crossing accidents were:

	1919		1925	
	Killed	Injured	Killed	Injured
	1,232	3,558	1,784	5,916
Percentage of Increase			44.8%	66.2%

Number of automobiles registered:

	7,565,000	19,954,347
Percentage of Increase		163.7%

Ralph Budd, president of the Great Northern Ry., also quotes the rule in his letter but adds wisely:

"While all rules are broken from time to time, I think the accident record of American railways goes to show that sobriety has always been the custom, especially with employes having to do with the safety of passengers. Of course, every local and federal law which tends toward prohibiting the manufacture and use of intoxicating liquor, makes it easier for railways to enforce the rule.

Casualties to Railroad Employes From 1913 to 1926 Inclusive

Year Ended	Killed	Injured
June 30, 1913	3,715	171,417
1914	3,259	165,212
1915	2,152	138,092
Dec. 31, 1916	2,941	176,923
1917	3,199	174,247
1918	3,419	156,013
1919	2,138	131,018
1920	2,578	149,414
1921	1,458	104,849
1922	1,648	116,757
1923	2,022	152,218
1924	1,533	124,882
1925	1,594	118,874
1926	1,666	111,517

Excludes casualties sustained by employes not on duty in non-train accidents.

"There need be no argument as to the propriety of asking that the men who handle locomotives and trains on a railway be sober. The same attention, however, is not given to enforcing sobriety on the part of those who handle more dangerous vehicles on the highways of the country. Prohibiting anyone driving an automobile while intoxicated would do a great deal toward solving our prohibition question, wholly aside from the personal liberty phase of the matter of drinking."

"I am not aware of any reversal of attitude by railroad executives as to the effects of the prohibition law," says Hale Holden, president of the Burlington, "nor does our experience indicate that accidents on the railroads have any relation to the use of alcohol among employes. Long prior to the passage of the law, the use of intoxicating liquor on railroads was prohibited and was rarely encountered; to the extent that it may have been used, there is distinct evidence that the use of it has decreased, and at many points where there are headquarters for employes the evidence is that as a whole they are relatively prosperous, meeting their obligations promptly, saving their money and buying homes, and giving their children better educations than formerly."

Coming to the opinions of general managers and those to whom they referred the question one finds included some extremely human viewpoints. One of the general managers on a western road says:

"We know that instances where men showed up for work under influence of liquor have been practically negligible since prohibition, and from our general knowledge it is our view the prohibition amendment has had a decided effect in bringing about sobriety among railroad employes.

"A great many accidents are being reported today that would not have been reported prior to 1920. Two reasons account for this. First: the amount of damage resulting from accidents which must be reported to the I.C.C. remains the same as when originally established, namely, $150. Material and labor costs were much higher

during the five-year period after prohibition than were effective during like period prior thereto, resulting in very large increase in number of accidents reported to the commission, but the actual damage is no greater, if as great, as the many accidents occurring prior to the higher cost period which would not have been reported. Second: our own instructions for reporting accidents are much more stringent now than they were years ago. We require every accident, no matter how trivial, to be reported; hence the record on basis of number of accidents, in our opinion, is valueless. There is, however, one measuring stick which might be of value and that is, comparative cost of clearing wrecks. As a matter of information in this connection for the three years prior to 1920, the total cost on this unit for clearing wrecks was $110,939, or average cost per 100,000 gross ton miles of $1.064. For the years 1924, 1925 and 1926 our total cost for clearing wrecks was $76,728, or average cost per 100,000 gross ton miles of $.675, a reduction of approximately 38 per cent. It seems to me this is evidence that accidents since prohibition have decreased as compared to the period immediately prior thereto.

"Generally speaking, living conditions of employes and their families are much better now than before prohibition."

Another general manager had a conference with all his officials, and from this decided these things:

There has been a decided improvement in the sobriety of all employes since the prohibition law was enacted.

A very careful and elaborate investigation developed there had been a steady decline in the number of accidents and number of injuries to employes since 1920. (The prohibition amendment was passed in 1919, and the Volstead Act in 1920.) This officer continues:

"From general observations of our operating officers it is the consensus that living conditions of employes and their families are materially better than before prohibition, but it is of course probable that some of this betterment might be attributable to higher standard of wages that now prevail as compared with those in effect prior to enactment of the prohibition amendment."

The Highest Type of Men in Train Service. No Man Who has Lived Long Enough to Know Something About Traveling Ever Expects Anything From This Type Except a Fine Understanding of Very Important Jobs.

Still another general manager says, "While we still have violations of Rule G, I have no hesitancy in saying the number of these cases does not begin to compare with those of former years before prohibition. There probably is no doubt that more or less drinking is done secretly, but the sum total does not, in my opinion, compare with pre-Volstead days.

"The records will disclose that so far as this road is concerned, Mr. Gibbons's statement about an increase in accidents, is not justified.

"There is no doubt that the living conditions of employes and their families are vastly better than they were before prohibition.

"I have nothing tangible upon which to base a statement one way or the other concerning the domestic relations of employes. On the whole, it seems to me the marked improvement in their living conditions as contrasted with former years, certainly should bring about more harmonious relations."

A general manager in the West whose jurisdiction includes territory more than ordinarily arid and perhaps tending, through loneliness, to relaxation in the presence of intoxicants when obtainable, says conditions have improved vastly since the prohibition law was enacted. "Prior to that time," says he, "the conditions at our district terminals with respect to drinking were very bad. With the opportunities for indulgence on the part of employes, operating officers found it extremely difficult to maintain sobriety among them.

"Since the prohibition amendment the condition that existed previously has been almost eliminated. Intoxicants can be had only surreptitiously, and with the restricted opportunities and supplies we have very little trouble with violations of Rule G. If it were possible to secure complete cooperation of civic officials in eliminating 'blind pigs' or 'bootlegging' joints, we should have

practically a perfect condition with respect to drinking. The small amount of intoxicants that would be made at home for individual use would be negligible.

"There can be no doubt that in our territory domestic conditions of employes are better than before prohibition. This is a natural result of material curtailment of opportunities for dissipation, and naturally the domestic relations of employes will be more harmonious."

President J. B. Hill of the N. C. & St. L. Ry. made an exhaustive investigation among his forces, and came to this conclusion:

"It is the consensus among those in control of transportation matters of this railway that since prohibition laws have been in effect there has been a great improvement in the character of the service. There has been an improvement likewise in the manner in which the employes are caring for their families, educating their children, and in accumulating some surplus for old age. It is estimated there has been a decrease in drinking of at least 50 per cent and perhaps substantially more.

"We are unable to say to what extent accidents have decreased, due to prohibition, for the reason that very few accidents have been attributed to employes being under the influence of intoxicants.

"During the days of the open saloons, many employes were out of the service at all times on account of drinking, while, at present, very few are out of work for that reason.

"It is my judgment, as well as that of the officers of this railway, that the economic condition of the employes has greatly improved since the prohibition laws came into effect, and that railroad operation has profited very greatly therefrom."

A high official of a Middle West railroad declares:

"My experience has not been the same as that of the New Haven official quoted. So far as I am able to determine, since prohibition has been in effect we have had less drinking among train and enginemen than previously, and I do not recall off-hand any cases among other employes of the departments reporting to this office. My opinion is there is less drinking among the rank and file of railroad employes at present than there was prior to prohibition becoming a law."

And there you are. Rule G is still in force. It was in force long before Volstead appeared on the horizon. Railroad men, but especially those having anything to do with the operation of trains, know drinking will not be tolerated by their companies. They have known it a long time. Of course, in any army of two million men some will drink if they have to depend on red ink or furniture polish. But they won't remain long on a railroad pay roll.

They're Not "Private" Cars

The Atlantic Coast Lines are doing a fine thing in sending out this information:

The only sure way that railroad executives can know what is going on along the line of road is to get out and see for themselves. These men realize, also, that five minutes personal contact with employes and patrons is worth a ton of letters. Then too, they have to attend a great variety of important meetings at widely separated points.

All of which means that most railroad executives and supervisory officers have to spend a large part of their time in traveling. In addition these men are called on to handle a vast amount of office work which accumulates with startling rapidity if not taken care of every day. Unless they can work while they travel important matters cannot receive prompt attention and the whole railroad organization is slowed down.

A final consideration is that the irregular hours, frequent changes of water and food, and loss of sleep and rest, that are inevitably experienced during constant travel, are exceedingly trying on even the hardiest constitutions. It is important that railroad executives keep themselves in the best possible physical condition as even a slight indisposition may seriously interfere with the conduct of railroad business.

For these reasons it has been found by experience that it pays to have a limited number of business or office cars for the use of high officials whose duties require constant travel.

Newspaper and fiction writers are apt to draw deft pictures of the "palatial private cars" of rail officials, and to leave the impression of handsome fittings, rich food, and an atmosphere of luxurious and extravagant living.

Nothing could be further from the truth. The cars are office cars, and not private cars, and are built to combine living quarters with ample room to carry on business.

The front part of the car is ordinarily devoted to kitchen, storage space and sleeping quarters for a cook. Back of this is a space that does double duty as dining room and work room for a stenographer. Typewriter stands, stationery cabinet and other office appurtenances form an important part of the equipment. There is also a folding berth which supplies extra sleeping accommodations by night and a seat by day.

Ordinarily there are two staterooms.

The back, or observation end of the car has large glass windows to enable a good view of the track. In addition to tables and chairs it also has a folding berth. This space is used as a sitting room or outer office where employees or other visitors are received.

Work goes on steadily whether the car is moving or standing still. Important files are carried along. Mail is forwarded regularly from the home office, and is handled in the usual fashion.

Four Engineering Firms Combine

The Country's Largest Project of This Kind

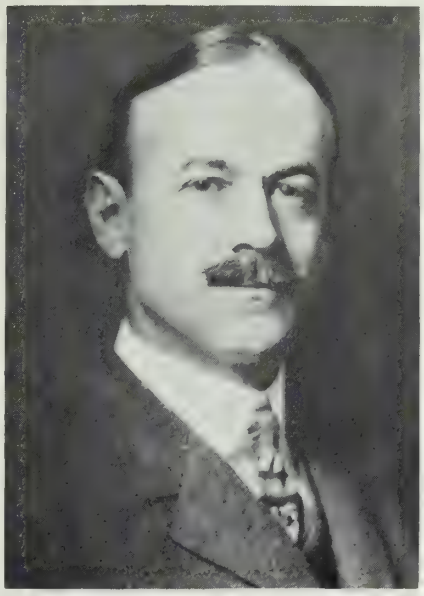
By H. B. Walker

THE largest engineering and construction company in the United States was announced January 16 at Philadelphia in a statement issued by Arthur W. Thompson, president of the United Gas Improvement Co.

"Four firms, widely known in this and other countries, have combined their interests and organized United Engineers and Constructors, Incorporated," said Mr. Thompson. "These companies are the U. G. I. Contracting Co., Philadelphia; the Public Service Production Co., Newark; Dwight P. Robinson & Co., Inc., New York, and Day & Zimmermann Engineering & Construction Co., Philadelphia. Headquarters of the new company will be in Philadelphia, with offices in New York, Newark, Chicago, Los Angeles, Atlanta, Houston, Pittsburgh, Montreal, Buenos Aires and Rio de Janeiro."

Dwight P. Robinson is president of the new company. The directors are Arthur W. Thompson, president, the United Gas Improvement Co., chairman; Dwight P. Robinson; Thomas N. McCarter, president, Public Service Corpn. of New Jersey; Samuel T. Bodine, chairman, board of directors, the United Gas Improvement Co.; Paul Thompson, a vice president of the United Gas Improvement Co. and president of the Philadelphia Gas Works Co., and John E. Zimmermann, president of Day & Zimmermann, Inc. The new company is launched with contracts in hand amounting to more than $100,000,000.

Dwight P. Robinson & Co. was organized in 1918 by the gentleman whose name the company bears. Two years later Westinghouse, Church, Kerr & Co., established in 1884, was absorbed. Since those days the Robinson company has been a leader in the construction of large office buildings, hotels and apartment houses in New York, Chicago, Boston, Buffalo and other cities. Activities, in addition to building work, include the design and construction of steam power stations, hydroelectric developments, substations, transmission systems, railroad shops, freight terminals, electrification of railroads, locomotive and passenger terminals, coaling stations, sugar refineries, smelters, lead plants, fertilizer plants, lumber mills, tanneries, shops, steel mills, foundries, textile mills, chemical plants, pipe lines and pumping stations, filtration and disposal plants, harbor and dock works.



Dwight P. Robinson, President of the Big Engineering Combine.

The company has performed a large volume of work abroad. The principal contracts consist of irrigation projects for the Brazilian government in northeastern Brazil, the construction of the embassy of the United States at Rio de Janeiro, and of the exhibits buildings during the Brazilian-Centennial Exposition, and the erection of an office building for the Rio de Janeiro Tramway, Light & Power Co., now in progress. In addition, important work is now being undertaken in Argentina. During the month a staff of Dwight P. Robinson & Co. engineers sailed for Seville, Spain, to execute a second contract for the United States government for the construction of a consulate building and two exhibition buildings for the Iberian American Exposition.

The U.G.I. Contracting Co.'s operations date back to 1882, when the United Gas Improvement Co. was incorporated to engage in engineering and construction. After the U.G.I. had branched out into the operation and management of utility properties, it continued the contracting business as a construction department. For years the principal work was building and installing Lowe carburetted water gas plants, patents for which were held by U.G.I. The operations expanded, taking in the building of coal gas and electric power plants and manufacturing and applying road binders.

The U.G.I. Contracting Co. was incorporated in April, 1919. It has built and equipped gas and electric plants, office buildings, factories, bridges, piers, tunnels and roads. It has built more than 1000 carburetted water gas plants. Recently it acquired the rights to build the German "Stettiner" coal gas ovens in America.

Among the steam power plants built by the U.G.I. Contracting Co. are the 50,000 KVA Barba-

does Island station, near Norristown, Pa., the 75,000 KVA Devon (Conn.) station, the 37,500 KVA Big Sioux (Sioux City, Ia.) station and the 33,333 KVA station of the Comal Power Co., New Braunfels, Texas. It also built the Stevenson dam and power plant on the Housatonic River in Connecticut and four dams and locks on the Ohio River for the United States government, which form part of the government's program to make the river navigable at all times. It has under construction extensive hydroelectric developments in Connecticut and Vermont.

The Public Service Production Co., a subsidiary of the Public Service Corpn. of New Jersey, was incorporated January 27, 1922. It built the $33,000,000 Kearny Electric Station, the Harrison Gas Works of Public Service, as well as a large number of substations, garages and other buildings, and has erected considerable mileage of high tension lines, and has done other work of importance for these organizations. It has also built roads in New Jersey, North Carolina and other states, including the so-called "covered cut," the approach to the Holland vehicular tunnel; has erected several important mills and factories and office buildings, including the 18-story Federal Trust Co. building at Newark, and has performed many engineering and construction services for public utility, industrial concerns and steam railroads.

The Day & Zimmermann Engineering & Construction Co. was organized by Day & Zimmermann, Inc., to handle their engineering and construction activities. This firm has a background of over 25 years' experience in the layout, design and construction of industrial plants, power plants, transmission lines and a wide variety of general structures such as hotels, office buildings, warehouses, and port terminal developments. The 220,000 volt transmission lines from Conowingo to the Philadelphia territory are now under construction by this organization. It has been responsible for the design and construction of hydroelectric and steam electric power plants such as the 60,000 KW (Saxton) station for Penn Central Light and Power Co.

During the war Day & Zimmermann did work for the United States army, the navy, the shipping board and the alien property custodian. Included among the projects done for government agencies was the United States army supply base at Philadelphia, comprising the largest piers and warehouses in the port of Philadelphia.

For many years Day & Zimmermann have been engaged in the layout and construction of large industrial enterprises such as new plants for the International Harvester Co., American Type Founders Co., Erie Forge and Steel Co., and many others. Institutional work has included such construction as the new dining hall and extension to buildings at Girard College, Philadelphia. Recently, Day & Zimmermann have entered actively the field of hotel and hospital construction and have been responsible for the construction of leading hotels in Rhode Island, Connecticut, Pennsylvania, New Jersey, Virginia and Florida. The work of Day & Zimmermann Engineering & Construction Co. is entirely separate from the investigation, report and management work which is done by Day & Zimmermann, Inc.

With the work now under way, including the construction of large dams for the government on the Ohio River, extensive hydroelectric developments on the Housatonic River in Connecticut, important work in South America and in Spain, and large office and apartment buildings in New York and other cities, United Engineers and Constructors starts business with an unusual program.

Opposes Cut in Rates on Farm Products

Speaking to a large meeting at Des Moines January 9, President J. E. Gorman of the Rock Island Lines said he was not worried in the least over the decrease in passenger traffic occasioned by the general use of automobiles and improved highways.

No one would welcome a way to reduce freight rates for farmers any quicker than he would, he said, but he was convinced such a cut was impossible.

"A reduction of any appreciable size to the farmer would jeopardize the road's position and throw it into bankruptcy with the first bad year," he said. "The same thing would happen to any other midwestern line which depends upon agricultural freight. A reduction in the end would be bad for the farmer."

Raising other rates to offset the loss is also an impossibility, he said, emphasizing the fact that he had made a study of the situation for years.

The Basic Purpose of Education

"When we get down to a question of real education there are only two things we can accomplish," asserts James J. Davis, United States Secretary of Labor, in January Current History. "One is to teach people to think about the problems they will meet and have to face in life. The other is to train them how to do the things they will have to do in life, the useful arts that will make them of some value to society. . . . The once accepted theory that the product of our general education system was educated and the individual who had learned how to work in his youth was uneducated is now being rapidly exploded."

More men marry because of kindliness and gentleness than because of beauty.

One Year of the Concrete Roadbed

Pere Marquette Results

By W. H. Harper

AFTER watching gangs of men working on a state highway, one day about three years ago, F. H. Alfred, president and general manager of the Pere Marquette Ry., asked this question:

"If a state finds it economical to do away with good gravel roads and provide a permanent concrete roadway for automobiles, trucks and buses at a cost of $50,000 per mile," he said, "why wouldn't it pay the railroads to do the same thing for their immensely greater tonnage?" He continued, "It ought to be possible to build a track that would stay put, with practically no expense for maintenance except for renewing the rail."

View Showing the Grouting Process in the Leveled Subgrade, Concrete Permanent Track Support of the Pere Marquette.

The thought remained in Mr. Alfred's mind. He talked about it to the members attending the annual dinner of the American Railway Engineering Association, and stirred up again an idea that had been an engineering vision for a long while. Objections there were galore. In the first place no one ever had contemplated such a thing as putting steel rails directly on a concrete bed. Even such high authority as the Portland Cement Association was said to have suggested resting the rails on wooden blocks; and this didn't please Mr. Alfred. Everyone seemed to believe there must be a cushion of some kind, some resilient material between the rail and the concrete to lessen shock due to passing loads and prevent deterioration of the concrete base, battering of the rail, and injury to rolling stock. True, some street railways were using girder rails resting on concrete; but this was a different condition, where loads were much lighter and the rails, in addition to resting on concrete, were completely imbedded in it.

Eventually, however, a stretch of the Pere Marquette roadbed was taken up and relaid in solid concrete, and the test began. The experiment was described in this magazine last May. Speaking of the satisfactory results, before the Maintenance of Way Club at Chicago in late December, Paul Chipman, valuation engineer of the Pere Marquette said:

"As we studied the subject, the conviction grew that there was a confusion of thought in this matter. It had been assumed that the shocks and jars experienced when a train passes over ordinary track would still exist on track of a rigid type; and that due to such rigidity the damage to track and equipment would be greater. The conclusion was correctly drawn, but we doubted the major premise. On a perfectly smooth and rigid track, why should there be any shocks? If no shocks, why should there be any hammering of rail and roadbed? Furthermore, by supporting the rail rigidly throughout its length the rail-wave, with all its attendant evils, would be banished. But would the concrete stand the strain? Why should it not? Surely, a 90-lb. rail could be counted on to distribute its load evenly over a longitudinal distance of 10 in., thus giving 50 sq. in. of concrete to support 30,000 lb., or a pressure of 600 lb. per sq. in. or, allowing 50 per cent for impact due to counterbalance, a pressure of 900 lb. In these days of 5,000-lb. concrete, that did not seem out of reason, especially when it is realized that compression tests of concrete are made by applying pressure to the ends of short cylinders, and that the strength of concrete under a load applied to a limited portion of its surface has never been determined, although known to be much higher than that shown by the standard tests.

"Past experience indicated that a cushion of wood or other resilient material would become a continual source of uneven track and

The Rails in Place on Concrete Slabs, Looking East Near Beech, Mich. No Ties Nor Ballast Needed Here.

expense for renewals. Further, it did not do away with the rail wave, which would no doubt lose some of its customary vigor, but would still be much in evidence. It became more and more apparent that the advantages of a permanent roadbed could not be obtained unless a rigid type of track were proved to be practicable; and that the primary purpose of our experimental installation, if made, would be to determine this point.

"The problem then was to construct a support for the rail that would be wide enough to so distribute the load as not to exceed the bearing power of rather soft soil and of such strength as to span safely any very soft spots of ordinary size; to produce a rail seat that would be in as nearly perfect line and surface as it could be made; to design adequate rail fastenings; and if possible to devise some means by which the concrete slab could be restored to its original elevation in case of pronounced settlement of the embankment."

Finally an experimental roadbed was decided upon, and pouring of concrete began in early November a year ago and finished December 2, the actual mixing and pouring being under the supervision of representatives of the Portland Cement Association. These gentlemen also kept the records of the test and made the photographs. Mr. Chipman tells the story:

"What conclusions are to be drawn from the first year of operation, which was concluded two days ago? First, in regard to the main question, whether a rigid roadbed is practicable or whether a railroad track must have more or less flexibility, I think we may say that practicability of a rigid roadbed, provided it is also a smooth one, has been proved beyond a doubt. A year's traffic has not resulted in any disintegration of the concrete beneath the rails nor in any undue battering of the rails themselves. The effect on rolling stock cannot, of course, be determined definitely by a test section a quarter of a mile long; but a ride over this section is enough to bring the conviction that there can be no bad effect. The train glides along so smoothly that one feels, with the elimination of the wear and tear due to the ups and downs of ordinary track, that a considerable saving in maintenance of equipment may be expected.

"On the receiving rail at the 68 joints, the amount of batter, as defined by the committee on rail of the A. R. E. A., is as follows: one joint has a batter of 3/64 in.; 9 joints have a batter of 1/32 in.; 16 have a batter of 1/64 in., and in 42 the batter is too small to measure. It would be hard to find a piece of ordinary track in use a year, under like traffic, that would show a better record. There are, however, a number of joints with a type of rail batter which is not so common on ordinary track. Here, the receiving rail is not battered at the end, but from 2 to 6 in. from the end a slight depression begins which varies in length from 6 to 18 in. Under the A. R. E. A. definition, this would not be classed as batter, as this definition calls for the use of a 12 in. straight edge and measures the batter by the distance between the surface of the rail and the straight edge at a point ½ in. from the end of the rail.

"In my opinion, this type of batter is due to the delivering rail being slightly higher than the receiving rail. It takes 1/32 of a second for a body to fall 1/64 in. In that time a wheel moving at the rate of 30 miles an hour would be about 16 in. from the joint, at which point the wheel would strike the rail. It hardly seems possible that the impact due to a fall of 1/64 in. would have any effect on the rail surface; but when we consider the enormous compressive stress developed in the small area of contact between the wheel and the rail under normal conditions, it is easy to believe that the additional stress due to impact would result in some distortion of the rail surface. The indications are that there will be very little battering with this type of roadbed, except that due to inequality in the heights of adjoining rails. If this proves to be the case, grinding the high rail may prove advantageous. However, observation of the end of the delivering rail inclines one to the belief that batter of this type tends to correct itself by the wearing down of the delivering rail, and that after a certain stage is reached, its progress will be slow.

"In finishing the concrete rail seat no attempt was made to perfect the finish on any portion that

would not lie immediately beneath the rail. This resulted, at places, in a slight ridge just outside of the rail seat, which makes it hard to be certain that there has been no abrasion of the concrete under the rail; but the fact that such apparent depression occurs only for short distances indicates that it is due entirely to the way in which the rail seat was finished, as the conditions which would cause wear are practically the same throughout, both as to the quality of the concrete and the motion of the rail.

"The concrete is in excellent condition. In slabs numbers 1, 11, 33 and 34, hair cracks have appeared which extend the full width of the slab. In slab 1 this marks a construction joint located about 10 ft. from one end, delays incident to starting the work having made it impossible to finish this slab on the first day. Slabs 33 and 34 were laid in very cold weather, although this may not be the reason for the cracks. None of the cracks show any indications of widening, and levels fail to show any deflection at or near the cracks. It was expected that some such cracks would appear. With the exception of slab 1 they are all near the center of the sections in which they occur.

"When operation began, the rail on the east approach started creeping westward in the direction of traffic and pushed the rails on the concrete forward until the joints were closed for several hundred feet. The rail was put back in place and the approach thereby anchored; since that time there has been no trouble with creeping. The maximum movement has probably not exceeded three inches.

The Concrete Roadbed Complete.

"The sound made by a train in passing over this section is different from that on ordinary track. There is a rumble that has a touch of metallic clang, probably due to the reflection of the noises made by wheels and trucks from the surface of the concrete. However, there are no clicks when the wheels pass over the rail joints. Probably the sum total of the noise is no greater than on ordinary track, although its quality is different.

"Our experience with this test section has brought to light a number of ways in which the present design can be improved. The fibrerock which was placed under the rail was found to be unsuited for the purpose. This material has little strength when saturated with water and in spite of its asphaltic content, is quite absorbent. After becoming wet the edges dry before the center, and the lateral motion of the rail is sufficient to split the material and cause it to work out at each side of the rail. After this happened, trouble was experienced with signals after a rain. This trouble was found to be, for the most part, near the west end, where in two or three places the steel plates came close to the surface. This was relieved temporarily by blocking the rail up on small pieces of insulating fibre, but trouble was still experienced during and after rains. Within the next few days a strip of insulating fibre will be placed under one rail for the entire length of the section. The whole problem of insulation can be solved by so changing the design that the rail will not be in contact with or close to any other metal which would convey current to the ground or the other rail. If it is necessary to provide a metal bearing for the rail, such bearing must not be connected with any tie rods or reinforcing bars.

Close-up of the Rail Fastenings.

"I believe that our experience with this roadbed would be sufficient to convert any person who had been opposed to the canting of rails. It is unfortunate that this was not done on our experimental section. After a year's service, parts of certain rails are not much more than half converted, owing to the rail not being canted. Such batter as has taken place is much more pronounced on the inside of the rail.

"No attempt has yet been made to determine the difference in tractive effort on this section and on ordinary track. The section is too short to make any conclusive investigation with a dynamometer car. Something might be done by measuring the retardation of drifting cars, but so many observations would be required to get conclusive data that it has not been attempted."

On the computed income of stock held by the Great Northern that railway was assessed in back taxes $677,043 by the Commissioner of Internal Revenue. On taking the matter before the Court of Appeals the assessment was lowered to $100,000, the court holding that as much of the stock had not paid dividends it was not assessable.

Parker Talks to Short Line R. R. Association

Legislation providing for "Absolute voluntary consolidation" of the railroads of this country was advocated by Congressman James S. Parker, of New York, chairman of the house interstate and foreign commerce committee, addressing the annual dinner of the American Short Line Railroad Association at the Willard Hotel, Washington.

"I do not believe," said Mr. Parker, "that consolidation of railways is the panacea for all ills of transportation. But I do believe that consolidation with the proper safeguards is very decidedly in the public interest, and I shall use every endeavor to try to pass a consolidation bill for voluntary consolidation, where it is thought this consolidation is in the interests of the public. The policy of consolidation that appeals to me as being the only one that we can put into effect is absolutely voluntary consolidation. The interest of the public is always safeguarded, for before any consolidation is entered into, the Interstate Commerce Commission must find that the consolidation is in the interests of the public.

"It is generally recognized that a railroad system must be in a sound financial condition to give the service to which the public is entitled. The object of consolidation is not primarily to put the railroads in a sound financial condition; we are only interested insofar as their financial condition is reflected in the service they render. We are not interested in the creation of large, gigantic systems. We are interested simply in the development of systems that will give the public the best possible systems of transportation at the lowest possible rates.

"Any system of consolidation must include the preservation of the weak or short lines that are necessary to serve the public. Weak and short lines in a vast majority of cases do not give the service to which the public is entitled simply and solely because they are financially weak. Weak and short lines must be tied into strong systems where the service will be what the public has a right to expect.

"Another great advantage of consolidation will be the competition in service between systems that are comparatively of the same strength. One of the most important results in my judgment in consolidation is the simplification of government regulation. About 1500 companies are operating railroads in this country and every single railroad has its own problems which must be threshed out with the Interstate Commerce Commission. If we have a small number of large systems, the task of regulation would be very much simplified, and the public would be greatly benefited. Very many of the annoying discrepancies in rates which now exist would be wiped out.

"It is often impossible to perfect rate consolidations immediately on account of the inability to finance them. The sums involved are too large. I believe, however, that consolidations should be allowed to be started through the purchase, or lease, or in any manner that meets the approval of the Interstate Commerce Commission when that body is convinced that the ultimate object is a complete consolidation. In any legislation that is drawn care should be exercised to put such safeguards so that a repetition in the condition before the passage of the Sherman Anti-Trust Law and the Clayton Act will be impossible."

The Station of the Atlantic Coast Line at Fort Myers, Fla., Fits Into the Surroundings Very Beautifully.

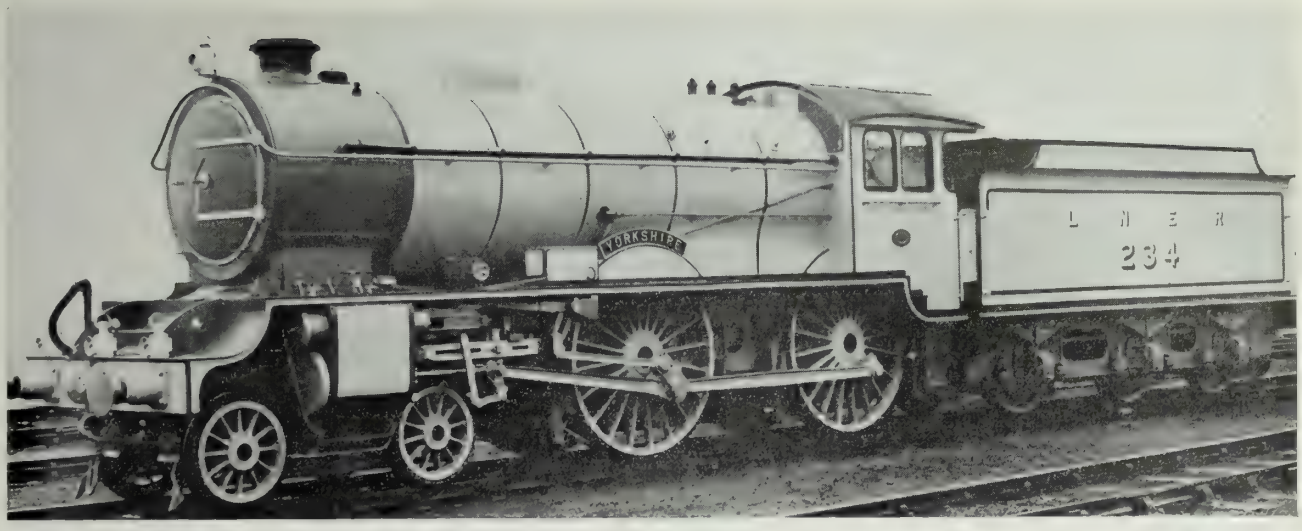
But What About Football?

The police of Burlingame, Cal., are to be directed by radio. A 50-watt transmitter has been installed in the police station and every police car has a receiver with a fixed wave length.

When a man in Burlingame strangles a woman all cars will be notified by radio. One policeman will drive while the other listens to directions from headquarters. Severe penalties are promised for policemen who change the wave length to listen to jazz.

It is noble to entreat us to love one another. Clemenceau, however, would first have us tolerate one another; a wonderful achievement in itself.—The Paper Book.

Arranged in a straight line, the railways of the world would reach to the moon and back again.



—Wide World Photos.

This is a Fine Example of the New "Shire" Class of Three Cylinder Passenger Locomotives, 4-4-0 Type for Intermediate Services Principally in the Northeast of England and Scotland. The London & North Eastern Ry. Has Built 28 of These Locomotives, and Has Others under Construction.

Training for Railway Work in England

Liberal Apprentice Courses

By Sir Ralph L. Wedgewood, C. B., C. M. G.

Chief General Manager

London & North Eastern Railway

A VERY important part in the policy of the London & North Eastern Railway is assigned to educational work following the traditions of certain of the constituent companies which were merged in 1923 in the new amalgamation. The company is at all times ready to take any progressive measures in the matter of education which will fit its employes for higher posts in the service, and which in turn tends to improve the general efficiency of the organization. The value from the economic point of view of the mental development of employes has been recognized, and the account which follows will give some indication of the educational activities encouraged. Broadly speaking this work may be summarised under the following main heads:—

1—Qualifying examination for junior clerks before appointment to permanent staff.
2—Continuation of education of clerical staff in railway subjects.
3—Traffic apprenticeships.
4—Education of apprentices in technical departments.
5—Mutual improvement classes.
6—Institutes and libraries, including literary societies.
7—Debating and lecture societies.
8—Staff magazines.

The following brief comments refer to each of the foregoing subdivisions in order:—

1.—Candidates, before appointment in a probationary capacity to clerical positions in the company's service, are required to pass satisfactorily an entrance examination bearing on general education which comprises tests in dictation, English, composition, mathematics, geography, intelligence and general knowledge. This examination normally takes place between the ages of 15 and 17 years, but every junior, before being appointed as a permanent clerk, is required to pass what is known as a "qualifying examination" which is normally taken at the age of 17½ years. If successful the junior is appointed to the company's permanent staff on his 18th birthday. All candidates are required to take English, commercial arithmetic, and a paper on present duties (including questions on elementary railway geography and general railway knowledge), while a fourth subject varies according to the work of the office in which the clerk is employed, e.g. shorthand and typewriting, elementary station accountancy, telegraphy, etc. If unsuccessful, a junior is allowed another attempt three months later, but if he fails at the second attempt his services are dispensed with.

2—The next phase of the clerk's education is entirely optional, and in this connection the company incurs annually considerable financial expenditure. In the first place the staff is given every encouragement and facility to attend evening classes in passen-

ger and freight station working, accounts and train signalling regulations. These are held at numerous centers according to demand, and are conducted by expert members of the staff, no fee being charged the student. To a small extent similar classes are conducted in locomotive, stores, and engineering accounts and statistics for clerks engaged in those particular departments.

As a next step the company has, by arrangement with the various universities in England and Wales, instituted evening courses of lectures on railway operating, railway economics, railway law and railway and commercial geography at about 20 of the principal centers on the system, and here also the company affords every opportunity and facility to the staff to attend. In respect of these courses a nominal fee of 5s.—per subject is charged the student.

Both in respect of the railway classes and the university courses examinations are held at the end of each session and certificates issued to successful candidates. In the case of the university subjects the examination certificates are issued by the university authorities and monetary awards have been offered by the company, although, owing to stress of circumstances, these have recently had to be curtailed. A final certificate is granted by the company to all those who qualify in five subjects stipulated.

3.—The company has a scheme of traffic apprenticeships applicable to clerical staff, under which a limited number of the staff may qualify by competitive examination for obtaining specialised training in various branches of railway work in the traffic departments, with a view to fitting them for responsible posts in the service. Throughout the period of training their work is specially supervised by committees of the department officers.

4.—The importance of providing technical instruction to apprentices in the locomotive, civil and electrical engineering departments will at once be fully realized, and the company has established throughout the whole system a comprehensive scheme of instruction of this nature for both ordinary and premium apprentices. Apart from one notable exception referred to later, viz., the Stratford Mechanics Institute, the apprentices attend classes provided by local educational authorities, and, so far as evening classes are concerned, the company remits the fees of all ordinary apprentices attending such classes subject to their making 80 per cent of possible attendances (apart from illness or other special circumstances) and to a satisfactory examination report being received at the end of the session. At six of the larger locomotive centers upon the system, a limited number of about 200 apprentices (both premium and ordinary) are allowed to attend day classes, either two half days or one whole day a week, and in two or three cases at universities, for which the company bears the cost of the fees and wages of the apprentices while attending the classes. In addition, a limited number of scholarships is offered to selected students in the locomotive department who are thus enabled to devote the whole of the winter months during one or more sessions in order to qualify for degrees or other awards, and in these cases also the company pays full wages and fees in respect of such courses.

5.—At many stations the staff in various departments has formed mutual improvement classes, and the company provides them wherever possible with accommodation (including lighting and heating) in which to hold their meetings. The classes usually meet on Sundays and study the subjects connected with their work, one of the more experienced members acting as instructor. These classes are particularly numerous in the locomotive and police departments. The company gives every encouragement, and provides diagrams, models of machinery or other useful material.

—Wide World Photo

The Last Word in Pullman Luxury as Exemplified in Recent Equipment Purchases for the London & North Eastern Ry., for Use in the Service Between London and Sheffield.

6.—Throughout the system there are approximately 40 institutes of varying sizes, which, in most cases, occupy buildings specially provided by the company, while in addition the company renders financial assistance toward their maintenance. In the majority of cases the libraries form a very important part of the functions of the institutes; over 100,000 volumes are comprised in these libraries, a special section of which often is devoted to books on railway subjects. The Stratford Institute (London) probably is the most important, which, in addition to a membership of 2,000 and a library of 10,000 volumes, has important educational functions, and conducts upward of 15 classes each session in various subjects, several of which are intended primarily for locomotive apprentices. A locomotive class for drivers, firemen and cleaners has recently been introduced at this institute which has proved very successful. Certain institutes also include in their syllabus each winter a series of popular lectures on general subjects which are of educational value.

In addition to the foregoing there is quite a number of small lending libraries of technical railway books established in various head and district offices, to which the staff has access without charge.

One of London's Underground Trains—Tubes They're Called Over There—Running From Clapham Common to Morden. Grim Looking Station at Morden, Isn't It? P & A Photos.

7.—In certain of the larger centers of the system, the staff has formed debating and lecture societies for the discussion of any subjects affecting railway operation or organization. As will be appreciated, the range of subjects is a very wide one, and the existence of the societies has proved to have had a very beneficial effect upon the staff from the educational point of view. The societies are not controlled by the company officially in any way but the company's officers take a prominent part in the way of preparing lecture papers and initiating discussion, as well as by their frequent attendance at the meetings, and they render by the offer of essay prizes or in other ways any assistance they can in furthering the objects of the societies. The company also provides meeting rooms for the periodical discussions of the societies. In one instances, at least, it has been found necessary to promote a junior section of a society for the benefit of the younger members.

—Herbert Photo.

Snap Shot of the Aberdeen, (left) and the Palment, Fast Express Trains Leaving Edinburgh, Scotland, As They May Be Seen Every Afternoon at 4:25.

8.—While the company's staff magazines necessarily contain a good deal of information relative to the social side of railway life, the inclusion of articles of real educative value is not overlooked. Articles frequently appear bearing on various aspects of railway working, and experience shows that these are very much appreciated.

In conclusion it may be stated that the company is fully alive to the importance of improving the general intellectual standard of its staff, and no opportunity is lost of taking any steps within its power with this object in view.

Electricity Operates This Bridge

For Railroads and Highway

By B. S. Havens

General Electric Company

A SWING bridge, electrically operated, with a special arrangement of control equipment, has recently been put into operation by the American Bridge Co. at Fort Madison, Iowa. The bridge is a combination railroad and highway structure and carries the tracks of the A. T. & S. F. Ry. across the Mississippi River.

The bridge is of the skew type; that is, the span, when closed, makes connection with the shore sections at an oblique angle. Thus it is essential there be no overtravel, or much damage would be done the bridge. Each motion of the bridge is provided with spare motors.

The bridge is completely motorized with General Electric motors and control. There are four motions: the swing, end lift, barrier lift and rail lift. The swing motion controls the rotation of the span, and is operated by four slip-ring motors, any one of which may be cut out of operation. The end lifts raise the ends of the bridge into alignment with stationary sections. There are two of these lifts, each operated by a single slip-ring motor with an additional motor as a spare. The bridge is equipped with barriers on the highway and rail lifts on the tracks. The rail lift motion is controlled by a single motor with a second motor as a spare, and the barrier lift has no spare motor.

In opening the bridge, the operator simultaneously closes the barriers on the highway and raises the rail lifts. These motions are stopped at the proper time by track-type limit switches. The limit switches also establish a circuit for enabling the operation of the end lifts, and light a lamp on an indicating-lamp panel in the operator's cabin to show that the motion is completed.

The end lift is then operated to lower the ends of the bridge and leave it free to turn. This operation is stopped upon completion by the limit switches which establish a circuit for enabling the operation of the swing motion and which light signal lamps on the lamp panel.

The span is then free to move and can be moved until nearly open. When this position is reached, a geared limit switch operates and stops the motion. It is then necessary for the operator to return the master switch to the "off" position, and press a button before the motion can be completed. When the bridge is fully open a contact on the limit switch opens and prevents further travel in that direction. Pressing the push-button station opens the circuit to some of the accelerating contactors and limits the torque to approximately 100 per cent at standstill.

The closing of the bridge is accomplished in the reverse manner, except that, in the nearly closed position, two contacts in series are opened in quick succession. This is an additional protection in case one of the contacts should fail to open. No final limit is used on the fully-closed position, but a signal light is provided, operated from a track-type limit switch. This switch is operated by the end of the span when in the closed position.

The motion of the bridge from the nearly-closed position is also accomplished by returning the master switch to the "off" position and pressing the push-button, which allows the bridge to be closed under reduced power. The limit switch operated by the span completes a circuit so that the end lifts can be operated. There limit switches complete circuits so that the barriers can be raised and the rail lifts lowered simultaneously.

Control for the swing motors provides for operating as many of the motors as required. The control is provided with a main line switch and line and reversing contactors controlling the power to all motors. In addition, each swing motor has an individual overload relay and line switch, permitting it to be disconnected at any time independently of the others. Definite-time acceleration is provided so that the time of acceleration will be the same regardless of the number of motors in operation.

Control for the swing and end-lift motors is mounted on a single panel. A six-pole, double-throw switch is provided to select either of the motors on the end lift. This leaves one motor as a spare. The rail lift control includes a three-pole, single-throw switch for selecting either motor on the motion.

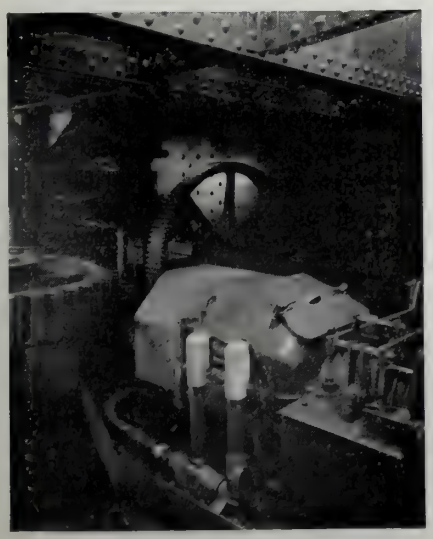
All motors on the bridge are provided with solenoid brakes. The coils on the brakes for all motors on a given motion are connected in parallel so that they can be released at the same time, and do not place a load on the motors in case the spare motor is not operating.

Some Trustworthy Bridges Of Other Days

The art of building wooden truss bridges was developed by Burr & Wernwag, two Pennsylvania carpenters, some of whose works are still in use after 80 years of faithful duty. A bridge built by Wernwag across the Delaware in 1803 was used as a highway bridge for 45 years, was then strengthened and used as a railway bridge for 27 years more, and was finally superseded by the present iron bridge in 1875.

These old bridge builders were very particular about the quality of their timber, and never put any into a bridge less than two years old. But when we began to build railways, everything was done in a hurry, and nobody could wait for seasoned timber. This led to the invention of the Howe truss, by the engineer of that name, which had the advantage of being adjustable with screws and nuts, so that the shrinkage ecould be taken up, and which had its parts connected in such a way that they were able to bear the heavy concentrated weight of locomotives without crushing. This bridge was used on all railways, new and old, from 1840 to about 1870. Had it been free from liability to decay and burn up, we should probably not be building iron and steel bridges now, except for long spans of over 200 feet.

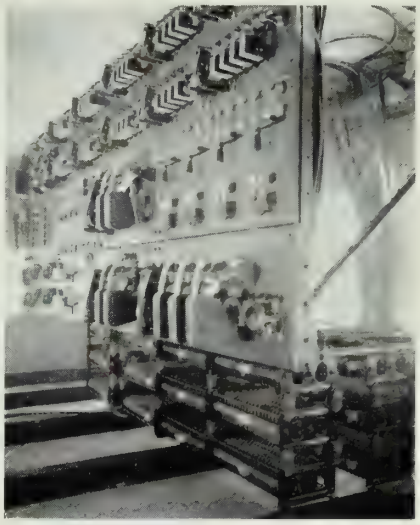
The Howe truss forms an excellent bridge, and is still used in the West on new roads, with the intention of substituting iron trusses after the roads are opened. —American Railways, Published 1888.



One of the Slip-ring Swing Motors

Rock Island Leads in Train Control

According to a report prepared recently by engineers for the Rock Island Lines, that railroad now has in operation automatic train control covering approximately 337 miles, of which 227 miles are double track and 110 miles single track, a total of 546 track-miles, the greatest track-mileage of any railroad in the world equipped with automatic train control. The train control zone to date extends from Blue Island, Ill., a suburb of Chicago, to Des Moines, Ia., comprising two operating divisions.



Front View of Control Panel.

There are at present 146 train-control-equipped locomotives operating over these two divisions.

The Rock Island began experimenting with automatic train control early in 1919, when one locomotive and one road-side station were equipped with the train control device. The results of these experiments were so satisfactory, that the train control company was given the privilege of making a larger installation, comprising 20 locomotives and 24 miles of double track extending from Blue Island to Joliet. This latter installation was placed in service in February, 1920, and continued in service as such until late in 1923.

In the meantime, the Interstate Commerce Commission issued its first train control order requiring each of 49 railroads to install a division of automatic control. The Rock Island completed the installation of its train control to comply with the first order of the commission by extending the test installation from Joliet to Rock Island, Ill. This completed the main line of the Illinois division, making a total of 165 miles of double track and 102 locomotives equipped with the contact device. This division was placed in service durin the latter part of 1923, was inspected by the commission November 20, 1923, and approved December 17 of that year.

Complying with the second or-

der of the commission, the Rock Island installed the same system of train control from Rock Island to Des Moines, equipping 62 miles of double track, 110 miles of single track, and 48 locomotives.

The territory in which the Rock Island railroad has train control in service includes the most important and heaviest traffic divissions on the railroad. Some passenger trains operate between Englewood and Rock Island, 175 miles, without a stop. Many heavy tonnage freight trains are run from Blue Island to Silvis, 158 miles, without stopping, except as may be necessary for coal and water.

The automatic train control on the Rock Island is installed as an adjunct to the present three-position semaphore type automatic block signal system. The train control is of the contact type responding to the three indications of the signal system, clear, caution, and stop. Under clear conditions, normal train operation is allowed as if the train control did not exist. Under caution conditions, a medium speed restriction is in effect of 30 miles an hour for passenger trains, and 25 miles an hour for freight trains. Under stop conditions, the low speed restriction of 15 miles an hour for all trains is imposed. The speed control is automatic, and cannot be changed or ignored by the engineer in the cab, the device automatically setting or releasing the brakes on the train, when under caution or stop signals. Otherwise, the train is operated by the engineer as if no train control existed. The electric device which applies and releases the brakes, is on the tender of the engine, and comes in contact with a ramp or "third" rail located at intervals along the track, being connected electrically with the semaphore block system.

Responsibility for the automatic train control is divided between the motive power and engineering departments. All train control having to do with locomotives is under the general supervision of the electrical engineer. All road-side train control equipment is under the general supervision of the signal engineer. The electrical engineer and the signal engineer work together and cooperate in all problems having to do with train control.

Electric Heaters for Change-Houses

A convenient and safe source of heat for change-houses in the oil and mining fields, and for use in building and construction work,

A New Electric Heater.

is offered by the new electric change-house heater, type HA, manufactured by the Westinghouse Electric and Manufacturing Co. at Mansfield, O. These heaters will be found useful for warming the houses where oil men or miners change clothes, for drying out the damp clothing and for heating luncheons. Offices and storerooms in mines or on construction jobs can be maintained at the proper temperature and watchmens' shanties can be made comfortable by one or more of the heaters. They may also be used in place of charcoal smudge pots or salamanders for drying plastering in new buildings.

The heater consists of an angle iron and sheet metal frame, two oven heaters being suspended under the shelf and protected by an expanded metal screen. A rack at the top is useful for holding clothing while drying, the shelf being used to warm lunches or for other purposes. An oil immersed switch is used for turning the power off and on. For ordinary applications where oil switches are not required, a WK-62 safety switch is used. The apparatus is strongly constructed and weighs slightly over 100 pounds. The overall dimensions are 18″ by 50″ by 50″ high. The power required is 10 kw. and a source of either 220 or 440 volts, single phase may be used.

In special cases where warm water must be supplied, cast water coils are clamped on either side of the heaters. These will furnish a considerable amount of heated water and the stored heat in the castings is sufficient to warm water passing through the coils.

An all-land railway route has just been placed in operation between Calais, France, and Assuan, Egypt.

Fully 700,000 more tons of motor ships are being constructed in the world than a year ago.

A gentleman is a rarer thing than some of us think. Which of us can point out many such in his circle—men whose aims are generous, whose truth is constant and elevated; who can look the world honestly in the face with equal manly sympathy for the great and the small?—Thackeray.

The railroads paid $352,000 last year for damage to canned goods in carloads, most of which would have been prevented had shippers stowed the goods tightly, removed nails, etc., put in proper doorway bulk-head and, when necessary, evened the car floor by using old corrugated strawboard or similar cheap material.

A New Deal for the Milwaukee

Reorganization Is Approved

By W. L. Harris

THE Chicago, Milwaukee & St. Paul Ry., began a new career, two weeks ago, when the receivership, entered in March, 1925, was closed by the federal court at Chicago, and the property went into the hands of the reorganized company as the Chicago, Milwaukee, St. Paul & Pacific Ry.

H. E. Byram, former president of the Milwaukee, is chairman of the new board of directors, and Henry A. Scandrett, formerly a vice president of the Union Pacific is the new president. Fourteen of the necessary 15 directors were elected January 14 when the plan of reorganization was approved by the Interstate Commerce Commission. Besides Mr. Byram and Mr. Scandrett, the directors elected are: W. W. K. Sparrow, Chicago; Joshua Green, Seattle; W. D. Van Dyke, Milwaukee, and Mortimer N. Buckner, Frederick H. Ecker, Samuel Fisher, Donald Geddes, W. W. Colpitts, Robert T. Swaine, Mark W. Potter, Walter Chrysler, George Roosevelt and Samuel Fisher, all of New York. It is expected that the fifteenth member, not yet elected, will be a resident of St. Paul or Minneapolis.

Harry A. Scandrett, the President of the Chicago, Milwaukee, St. Paul & Pacific Ry., Who Assumed His New Duties January 11. P & A Photo.

An order authorizing the receivers to turn over the property to the new company was entered in the federal court at Chicago January 11 by Judge James H. Wilkerson following receipt of a formal order from the Interstate Commerce Commission approving the plan of reorganization. Judge Wilkerson also entered an order calling for the deposit of securities in the hands of the reorganization managers by February 15.

The new corporation was empowered by the Interstate Commerce Commission to take over the 11,200 miles of track of the old system and to issue 1,174,060 shares of no par value common stock; $119,845,000 in preferred stock; $106,395,096 in 5 per cent mortgage bonds, and $182,983,693 in five per cent adjustment mortgage bonds, all of which will be exchanged for obligations of the old system.

Friends of Mr. Byram have known for some time that he did not desire to assume the responsibilities of president of the reorganized company, and desired to be relieved of some of his duties, which have been particularly arduous during the receivership. Mr. Byram is 62 years old. He was born in Galesburg, Ill., where he started his railroad career as a call

boy on the C., B. & Q. at sixteen. A string of promotions followed in rapid succession on that road and the Great Northern and Rock Island systems which he served later. He was president of the Milwaukee from October 1, 1917, until the road went into receivership in 1925.

President Scandrett is a bachelor, 51 years old, nationally known as a traffic expert, and widely popular, especially in the Pacific Northwest. He has been connected with the legal department of the Union Pacific since graduating from the law school of the University of Minnesota, his work being largely connected with rate matters, valuation, labor problems, and other matters arising under the Transportation Act.

During federal control he was traffic assistant to the regional director of the central western division. On the return of the railroads to private control he went back to the Union Pacific as valuation and commerce counsel, and on May 1, 1925, was elected vice president of the Union Pacific system. A railroad official on another line said of him when his election to the Milwaukee presidency was announced:

"Mr. Scandrett has been with the Union Pacific for many years and until recently was in its legal department. In his work as commerce counsel he necessarily became thoroughly familiar with the rate structure, the principles of rate-making, the division of rates and the traffic resources of the country generally, particularly of the West.

"He is a splendid lawyer, is candid, humorous, courteous and phenomenally able. He has a most engaging personality and is just the type of man to 'sell' the St. Paul to the communities it serves.

"While not originally an operating man, he has had to study transportation in its relation to efficiency, costs and similar matters in his rate work. He thoroughly understands the machinery of an operating organization, as well as a traffic organization. He is perfectly at home in dealing with operating, traffic and financial statements of every kind.

"He is fair, generous and broad, just the man to build up the right spirit in an organization and bring about that pulling together of the different departments which will mean much on the St. Paul. He can go into any conference of executives on any question, and because of the profound respect of others for his ability and character he naturally will lead."

The Electric Liner California

The Panama Pacific Line steamship "California," launched at Newport News on October 1, last, has been delivered to International Mercantile Marine. This vessel, of 22,000 tons, with a displacement of 32,450 tons, is the largest American built liner and the world's largest commercial vessel with electric propulsion. It is scheduled to sail from New York on its maiden voyage to the Pacific coast on January 28.

In type the "California" is unique among the vessels engaged in intercoastal service, since it is the first steamship of transatlantic type to be built especially for service through the Panama Canal. Her length is 601 feet, breadth 80 feet, depth of hull 52 feet and total depth from upper deck to keel 100 feet. She has capacity for 8,000 tons of freight and 750 passengers. Her maximum speed is 21¾ statute miles an hour, and though she will be run on regulated schedules to insure arrival at Havana and the Canal at stated hours, she will clip two days from the present 15-day passage between New York and California.

The "California" has no engines in the ordinary sense. Electric energy to drive her through the water is created by small twin turbines that drive two generators at the rate of 2,880 revolutions a minute. The energy thus created, rated at 17,000 horse-power, is transmitted by cables to two great motors, each directly attached to a shaft, on the outer end of which is a propeller 18 feet in diameter and weighing 39,000 pounds.

The electric energy generated in the "California" is 20,000 horse-power or 15,000 kilowatts, enough to haul a train of 2,000 freight cars, 20 miles long and weighing 83,000 tons, at the rate of 15 miles an hour. It is eight times the energy required to operate the Panama Canal.

The ship has 60,000 cubic feet of space for cool-air cargoes—largely California fruits—and 40,000 cubic feet of refrigerated space.

Still More Dog

The Central of Georgia has been made the object of a $6,000 suit brought by M. S. Hughes for the death of a dog caused by a train operated by the defendants. The complaint says that on September 27, 1926, he owned a dog valued at $6,000, which had strayed onto the tracks of the railroad near Union Springs, Ala. It is charged the dog was run over and killed through negligence on the part of the railroad.

Harmony

"It should be our constant and earnest endeavor mutually to cultivate a spirit of concord and harmony among the various parts of our confederacy. Of all the great interests which appertain to our country, that of union—cordial, confiding, fraternal union—is by far the most important, since it is the only true and sure guaranty of all others."—William H. Harrison, Ninth President.

If you want to commit the crime of killing time be sure it's your own.

Over 6000 tons of coal are required to carry a big liner across the Atlantic.

Two Motor Coaches Of Merit

Designed to Increase Revenue

By Howard Kennedy

The Twin Coach Has a Short Turning Radius Especially Adapting It to City Streets in Congested Traffic.

IN a short span of five years motor coaches have passed through three distinct stages. First was the converted motor truck era with the truck chassis surmounted by a box like body. Then followed swiftly the development of the low swung chassis particularly adapted for faster, smoother operation and the refinement of the separately mounted wooden bodies better fitted for passenger transportation. Yesterday's bus was completely obsoleted by overnight development of the present automotive motor coach. Physical depreciation raced with obsolescence to rule from the road equipment purchased to permanently satisfy an unfathomable demand for gasoline-scented transportation.

As the second era progressed veteran electric railway and railroad operators have been amazed by the surprisingly rapid depreciation of motor coaches, as compared with rail equipment. There has been a gradual but pronounced realization that the eventual motor coach on city lines would be a compromise between present coaches and modern street cars.

For mass transportation the advantages of long-life large seating capacity, provision for 150 per cent standee overload and facility of maintenance found in street cars may well be combined with the flexibility, mobility and freedom from fixed charges for power and track inherent in the motor coach.

With the past five years of motor coach transportation added to its 30 years of revenue transportation manufacture of rail equipment, the American Car and Foundry Motors Co. offers its Metropolitan all-steel 40-passenger coach as a vehicle combining most of the advantages of the modern street car and motor coach without the inherent disadvantages of

Brill Seats 35 Inches Wide, Upholstered in Real Leather, and Spaced 28½ Inches Back to Back, Enhance Riding Comfort in A. C. F. Metropolitan Coaches.

either. This coach and the Twin coach of the Twin Coach Corpn., Kent, Ohio, are the two outstanding examples of modern perfection in such vehicles.

With comfortable accommodations for 40 seated passengers and ample floor area to carry 40 or more standees without crowding, the A.C.F. Metropolitan coach effectively demonstrates the ability of a gasoline-powered vehicle to handle mass transportation in densely-populated areas. Naturally to provide more passenger miles per coach mile the external and internal form and structural framing of this advanced coach must violate previously established automotive designed motor coach precedents. Thus the floor plan and external appearance is somewhat akin to that of a modern street car while the all steel structural framing follows designs that the American Car and Foundry and affiliated companies have spent years in developing.

Instead of being a structurally self sufficient chassis with a superimposed box like wooden body, the A.C.F. Metropolitan coach comprises an all steel coach body possessing inherent structural strength to which axles are attached and in which the power plant, controls and seating are contained.

Where previous motor coaches have appealed either on the basis of income increasing ability or of lower cost of operation alone, the A. C. F. Metropolitan coach possesses both virtues in equal degree. The one centers about greater passenger carrying ability and more comfortable accommodations while the other hinges on different materials of construction and design.

Consider first the income side of the ledger, or the necessity of registering enough fares to leave a profit after paying operating cost. On city lines in densely populated areas the conventional motor coach admittedly lacks capacity to handle peak loads. Without undue crowding, 25-passenger motor buses handle a maximum of about 50 passengers, seated and standing. Further crowding tends to drive prospective passengers back to their own automobiles. On most lines, however, the volume of peak load traffic demands much more service than the base schedule of 25-passenger coaches can furnish. Surplus equipment, as trippers, must take the overload, the number of trippers and the mileage operated being out of proportion to that of street car operation. Thus the total investment in motor coach equipment may easily exceed that warranted by the net revenue available.

The ratio of coach miles to passenger miles, average of all coaches on all trips, required to show a profit is fixed and inflexible on each property. Knowing the operating cost per coach-mile to be, say, 30 cents, and the fare to be ten cents (both high) it is perfectly obvious that three passengers must be carried for every coach-mile operated on every trip by every coach. If the line is five miles long, the average load factor must be 15 passengers in a 25-passenger coach, or 60 per cent. The length of profitable haul is definitely and mathematically limited by the average load factor of all coaches on all trips.

The A. C. F. coach has a turning radius of 38 feet and therefore manoeuvers well in heavy traffic. The driver is seated back of the rear axle as in a conventional coach and since the front overhang is but 38½ inches, any coach driver without special training can handle this advanced vehicle safely.

The new Twin Coach of the Twin Coach Corpn., at Kent, Ohio, is revolutionary in appearance and general construction. And yet, upon careful analysis, there is said to be nothing experimental or untried about it. The coach uses standard type motors, standard three-speed transmissions, standard universal joints and drive shafts, standard worms for driving,

standard air brakes—metal to metal, standard wheels, standard steering mechanism, standard type front axle, standard spring construction of latest type. Mechanical features, the Fageol people say, have merely been re-arranged and proportioned to suit modern motor coach operation. These changes are the result of long experience and careful study. The history of the progress of motor transit equipment has shown the need of such a departure from old style practices.

The Kent corporation's designers saw that the earlier coaches, wherein capacities were smaller, weights lighter and the bodies were semi-flexible, were more successful in withstanding strains than the later and heavier models. Twisted front-ends of frames and distortion at the cowls were almost inevitable as weight, capacity and rigidity increased.

Discarding precedent, the designers have developed a motor coach which distributes torsional stresses evenly throughout a semi-flexible body—which seats 40 passengers, an increase of 40 per cent over old types, and which permits a weight saving of 30 per cent per passenger seat over old types.

The new Twin Coach with a single deck answers the many requests of operators for greater income capacity. It furnishes seats for 40 passengers with the long-sought aisle and extra space for standees equalling the seated load. The proved seasoned factors that the rail profession knows as imperative in public travel are blended into this ultra-modern motor coach —providing an up-to-date street car with a portable power plant.

Spacious Baggage Racks Overhead, With Unobstructed Vision, Makes Pleasant Riding in the Fageol Parlor Car.

Charts for Bus Record

Inquiries among many bus operators over a period of several months have led service engineers in the Mack-International Motor Truck Co. to believe that a monthly maintenance record for all types of buses in the operator's fleet would be of great value in determining the most economical make as far as maintenance is concerned. To this end, the Mack company has produced a chart so arranged as to show the day-by-day record of maintenance service on each make of bus. This chart, known as the "Record of Road Calls on Buses" is so designed as to take care of three makes of buses; for each three additional makes another chart must be used. Space is also arranged to take care of day-by-day records for thirty-one days. New charts should be started each month. Space is provided for records of maintenance on approximately one-hundred parts of the bus or reasons for service, divided into sixteen groups with additional space for a record of accidents and pull-ins. Other columns are designed to show totals and percentages in such a manner that an operator will be able to determine at any time which make of bus is costing him the most money to service, the reason for service and when. This may be determined on the bus as a whole or on any one of the sixteen groups. At the end of any month after completing the chart an operator can tell at a glance which of his various makes of buses is giving him the most trouble. It is also possible to determine which particular assembly on any make is causing the most trouble when steps may be taken to eliminate the causes. These forms may be obtained by addressing the general bus department of the Mack-International Motor Truck Corpn., 25 Broadway, New York.

Large Order for Buses at Spokane

An order for 12 motor buses to cost $125,000 has been placed with the Fageol motor factory at Oakland, Cal. by the Auto Interurban Co. of Spokane. According to C. F. Hawley, secretary of the company, this is the largest order for buses placed by one stage company in the Pacific northwest in 1927.

"Due to the growth of the business in the last few months, we are replacing all our older equipment with the modern 30-passenger de luxe buses" said Mr. Hawley. The buses will be placed in use on the present runs out of Spokane to valley points, to Coeur

This Is the A. C. F. Metropolitan Coach Shown in Detroit Service. Rides Smoothly and Resembles a Pullman.

d'Alene, Spirit Lake in Idaho, and other lines. These additions in equipment will bring the rolling stock of the company up to date. Prior to this purchase a number of single buses were purchased for use on short runs.

"For the last 15 days we have hauled an average of 2,000 passengers a day and are now carrying capacity loads on almost all buses. This is due to the natural increase in travel resulting from good service, the Christmas rush and the taking of private automobiles out of service for the winter months.

"We have suffered but few delays because of snow in the Inland Empire. We are running a big snow plow of our own make, operated by two engines having a four-wheeled drive, to keep the highway open between Spokane and Coeur d'Alene.

Every Little Bit, Added to What You've Got—

Salvage of a penny here and a penny there enabled the Southern Pacific to save hundreds of thousands of dollars last year. A. S. McKelligon, general storekeeper for the company, says that even a dead dry cell battery, such as radio fans discard, has been made to yield profits to the railroad. More than 4800 exhausted batteries are salvaged monthly by the company, and although the saving upon a cell is not more than three-tenths of a cent, it was considered sufficiently important to warrant developing special salvage methods.

A machine, designed by railroad experts, strips zinc shells from the batteries and breaks apart the red wax covers and battery filler. The zinc is run into pigs and used for hardening other metals in the company's shops. Brass screws, caps and rods are removed and sold as scrap brass.

"The net saving of $180 by a corporation so large as the Southern Pacific, through operations involving the handling of 58,000 articles during the year," said McKelligon, "may appear too insignificant to merit attention, but it is through just such savings that care in use of materials and supplies is fostered, and a small fortune from salvage is contributed yearly to the company's treasury.

"In view of the narrowing margin between railroad income and outgo the importance of small savings and the stopping of small leaks is more important than ever."

A Tip That Motorists Should Heed

"The train is not expected to get out of your way" is the tip to motorists just handed down by the federal Supreme Court. It is of far-reaching importance in view of the heretofore accepted version that the railroad company was responsible in case one of their locomotives smashed up a family bus and perhaps sent some of its occupants on the Great Adventure. —St. Louis Star.

Shanghai and Nanking, China, are to be connected by an automobile highway 150 miles long.

The Fageol Single-Deck Coach Has Street Car Capacity, Excellent Vision, and Much Comfort.

Tinkering With the Railroads

By W. L. Ross

President, Nickel Plate Railroad

W. L. Ross, President of the Nickel Plate Railroad.

THE nation's railroads encounter no end of tinkering. This tinkering results in new laws, new regulation, and proposed new remedies of various kinds. Exactly 99 regulatory bodies govern the railroads. As many as 100 to 150 measures affecting railroads are introduced into congress in one year. The number introduced in the state legislatures can hardly be counted.

The railroad industry is openly conducted. Yet, it is the most over-regulated. I consider laws necessary. But there is such a thing as too much law. When you can't kill a bear in Pennsylvania, even in self defense, as was once discovered on the statute books of that state; when an alien can't sell fish and oysters in Florida, or own a dog in Pennsylvania; when a milkman can't deposit a bottle of milk on a doorstep—then, I say, law is carried too far. And that is how I regard the subject of railroad law. Let us have laws by all means; let us have railroad regulation; but let us have laws and regulation within the bounds of reason.

In the process of making laws, there is much discussion. Discussion sometimes points to alleged railway abuses, expressed in broad, general terms, levelled at no particular railroad. Consequently, no particular railroad responds or answers the criticism. For many years, you heard talk about over-capitalization. "Watered stock" became household words. But, how many people in this country ever realized that American railroads are the most conservatively capitalized in the world?

They are capitalized at one-half the capitalization of the French railroads; at one-third the capitalization of the English railroads. They are capitalized at about $71,000 a mile, whereas it averaged about $81,000 a mile to build them. They are capitalized at less than one-half what it would cost to reproduce them, mile for mile, today.

Of course, we are not perfect. And we shouldn't be above receiving suggestions. I am sure all railroads welcome constructive suggestions. But we would like to know how we are going to do some of the things we are told to do. We would like to know, for instance, how to reduce rates and coincidentally raise wages. In no other country do railroad rates approximate the low figures that obtain in the United States. In this country no business is compelled to operate on so thin a margin as six per cent on valuation—the limit fixed for railroads.

If some of the present-day suggestions were adopted, they would cripple railway service and stifle progress in all directions. Such suggestions are not in accord with the spirit of this age. If you want to know what the spirit of this age is, you have only to read the newspaper headlines. It is a spirit of economic progress, piling up hitherto unheard of national wealth, from which are flowing the benefits of education, the outcropping of the arts and the growth of our great cities. Nowhere in the world is there anything to equal it.

The newspaper headlines show the yearly income of the people as now reaching the sum of ninety billions of dollars; the payroll of

Part of an address delivered, January 17, before the Transportation Club of Peoria, Ill.

metropolitan New York running to one billion a year. They show General Motors declaring the largest dividend in its history. They show Henry Ford back in the field, after many millions expended in fashioning a new car that is to be the vehicle for what the newspapers proclaim as the greatest industrial comeback of all time. We read of great engineering feats achieved. The vehicular tunnel has been opened under the Hudson. Through this tunnel passed more than 52,000 automobiles in one day—part of the individual wealth of America moving on wheels.

We learn from news headlines that more than half of the mineable coal of the world is in this country—the greatest natural treasure any country possesses. We learn of a staggering national production. We read about an increase in the value of manufactured articles, from around 11 billions of dollars, in 1899, to almost 63 billions in 1925.

Transportation vitally touches the lives of all of us. It has been demonstrated even that the average everyday breakfast travels many miles. An exhibit in the Smithsonian Institute, in Washington, shows the breakfast orange as averaging a trip of 2,500 miles from tree to table. The coffee journeys a distance of 5,500 miles by rudder and rail. Other constituents of the average breakfast travel about as follows: Sugar, 1,500 miles; oatmeal, 800 miles; lamb chops, 1,700 miles; butter, 700 miles; and milk, 25 miles. Fuel to cook the meal averages about 200 miles.

In 1926 the food and fuel and other material needs transported totaled more than 53 million carloads. The task required more than 1,800,000 railroad employes. Their annual wages totaled close to three billion dollars. Equipment included about 2,400,000 freight cars, and 64,000 locomotives.

The railroads have provided service without breakdown, except for temporary disability occasioned locally by the Mississippi flood and the flood in New England territory. And in these disasters the recovery of the railroads has been unbelievably rapid.

Precision and rapidity of railway operation is general throughout the country. Freight moves on almost express train schedule. The jobbers, generally, no longer store away large reserves in expectation of transportation shortages. They get goods now on the schedules they want. "Hand-to-mouth" distribution has developed. By obviating large reserves in warehouses, much of the capital, heretofore frozen in the storage of goods, has been thawed out and put to work.

Quicker shipments mean quicker payment for goods, quicker liquidation of loans and stabilization of prices. These things tend to lower the cost of doing business.

Figure it out for yourself! The value of the products in motion at any one time is, say, 250 million dollars. That's a pretty fair estimate. Figure the interest per day on that sum! Now, determine how the cost of doing business is lowered and how prosperity is increased through every day saved by transportation efficiency—every hour saved, for that matter. Where the railroads used to talk about transporting products, say in the course of a week, they now talk about second-morning and third-morning delivery. I invite you to study the performance of the Nickel Plate in this connection.

The railroads help business and general prosperity in other ways. They pour back into business a stream of gold, mounting into billions, every year, through purchases of fuel, materials and supplies and through additions and improvements and the like.

Railroads are trying to reach a better state of efficiency. Toward that end unifications have been attempted with the view to economies and greater flexibility of operation and more efficient use of equipment. We have come to a day and age when far-flung systems are in keeping with far-flung national business development. Railroading is a business where the process of building is constantly going on. The railroads have been built and re-built over and over again. In the next ten years, it is estimated something like eight billions will have to be spent for improvements and expansion.

The B. & O. in 52 Story Building

The Baltimore & Ohio has concluded arrangements to occupy a large space on the first floor of the new office building, now being constructed at 42nd street and Lexington Avenue, New York City, as a passenger station and motor coach terminal for its train-side connection service. The new facilities will permit the motor coaches to enter the building from the 41st street side, driving to the center of the building adjacent to the waiting rooms and ticket offices, where passengers may board them for outgoing trains or leave them from incoming trains instead of at the street curb as at present.

The main entrance to the ticket office and station quarters will be on 42nd street opposite the Grand Central Terminal and Hotel Commodore, to both of which, as well as to the subway and the Biltmore and Roosevelt hotels, there will be direct underground connection within the building without going into the open.

Workmen on the narrow gauge railroad in Egypt recently struck following a 10 per cent reduction of wages which officials said was necessary because of losses arising from motor bus competition.

The thought that where there is a railroad track a train may be approaching is so simple it ought to be in the mind of every one who drives an automobile.

Noiseless Street Cars Possible Now

The W. N. Drive Does It

By C. Bethel

Westinghouse Elec. & Mfg. Co.

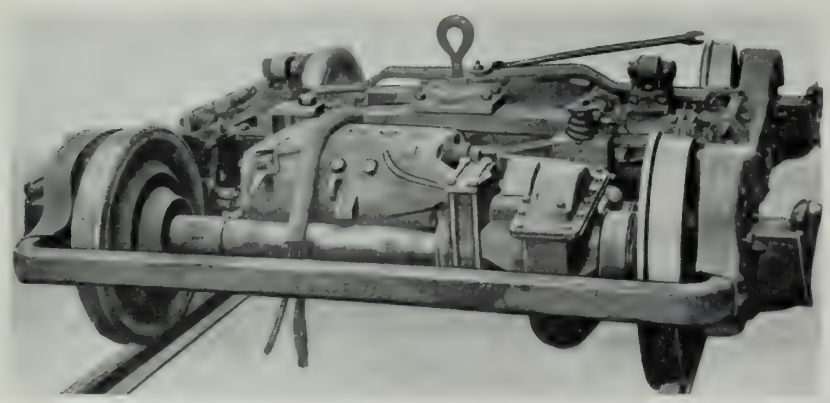
THE NEW W-N drive with its spring suspended motor is, without doubt, the most important street railway development since the production of the box frame motor. The principal results accomplished with the W-N drive are: quiet operation, spring suspension, light weight, high schedule speeds, and low cost operation. The Brill, 1928, Model car, on which the Westinghouse W-N drive and type 1425 motor are operating, is singularly quiet. No gear or motor noise is audible. The W-N drive gives remarkably quiet gear operation. The motor has been so designed as to reduce to a minimum the magnetic and windage noises of the motor. The low unsprung weight reduces the force of the "hammer blows" at rail joints and at special work, and thus contributes to quiet operation. When one considers that noise is one of the least desirable characteristics of street cars, the importance of these features of the equipment is evident.

The W-N drive provides for a maximum gear ratio of 10 to 1. This drive is equipped with Timken roller bearings throughout. This insures accurate gear centers and an accurate meshing of the gear teeth along the gear face. Helical gears are used. The gear face and the helix angle are so chosen that three teeth are always in contact at the pitch line. This insures quiet operation and freedom from vibration. The car rider cannot hear the slightest trace of gear noise during any part of the operating cycle.

In addition to the design provisions for the accurate meshing of the gears, which is a decided factor in increasing the life of the gearing, a further increase of life is assured by running the gears in a bath of clean oil. A number of progressive operators have been demanding for years that an oil-tight gear case be developed. The W-N drive successfully keeps the oil in and the dirt out.

It is not at all satisfactory simply to keep most of the dirt out. All of it must be kept out. Means for accomplishing this have required years of development. The design used in the W-N drive represents the combined result of the developments on roller bearing

The Brill 1928 Model Street Car Equipped with W-N Drive and Westinghouse No. 1425 Motor.



The W-N Drive and No. 1425 Motor Applied to Truck of Light Weight Car.

motors and the original W-N drive which has been in service for over 80,000 miles. All of this insures the maximum life for the gearing.

The original W-N drive, in a modified form, was placed in service in Wheeling, W. Va., in November, 1925. In this experimental application the gears were of the single reduction type. The present W-N drive differs from the original experimental drive mainly in that double reduction gears are used. This gives the maximum road clearance. The clearance under the gear case is 1 in. greater with 22 in. wheels than was formerly obtained with 26 in. wheels.

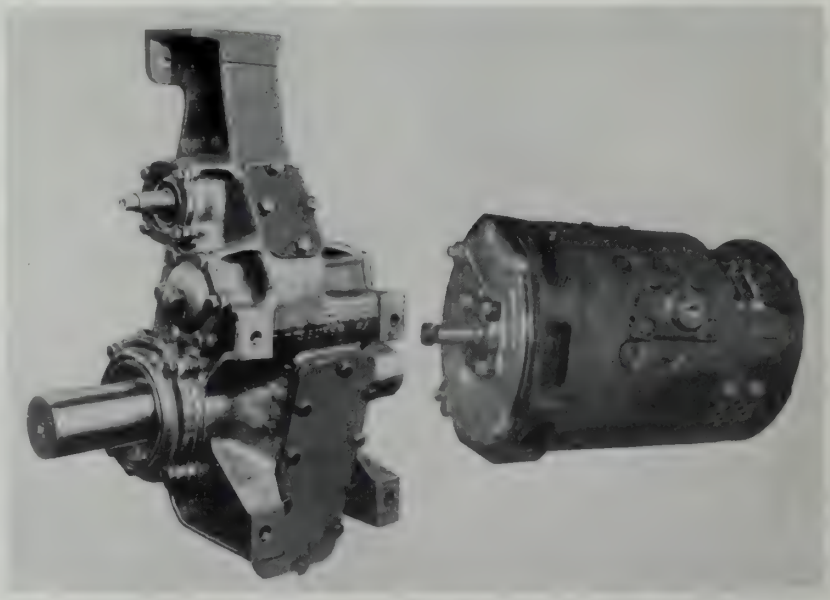
The entire motor is spring supported. The conditions of operation are thus much more favorable for the motor than those obtaining when the motor is mounted on the axle and subjected to all the roadway shocks. Approximately half of the weight of the gear unit is spring borne. The assembly of truck with motors and gears has an extremely low unsprung weight.

The motor is mounted on trunions and is connected to the gear unit by means of a flexible coupling or universal joint. These couplings are extra heavy duty, designed especially for railway service. The trunions are connected to swing links which are supported from a member extending from the truck transom to the cross member behind the wheels.

The gear unit is supported on the axle through two tapered roller bearings and on the truck transom. Thus the motor and about half of the gear unit is spring suspended. The universal joint and the trunion swing links provide for the slight movement of the pinion shaft relative to the armature shaft. In addition, the universal joint is flexible torsionally, which gives further protection to the motor and gears from the driving forces. This gives a complete flexible mounting, both as to suspension and drive. This is quite important.

Most railway motor troubles are mechanical or have a mechanical origin, such as broken loads, chafed coils, loose coils, worn and broken bearings, poorly meshed gears, gear vibration, chipped and broken brushes, loose parts, etc. The flexibility of this mounting and drive greatly minimizes these forces. The large gear ratio used in the W-N drive permits the use of a high speed motor. The type 1425 motor used with this drive is a very great advance in railway motor design. There has been a definite trend in motor design toward lighter and still lighter motors.

The most unusual feature of the motors is that they are designed for operating two in series on 600 volts. Everyone who has had experience with light weight, high speed motors with 600 volts per commutator realizes the advantages of operating with only 300 volts per commutator. Where the space is restricted and the commutator diameter is small the commutator bars must be very thin when an adequate number for 600 volts are used. The distance between brushholders is also very short. With 300 volts per commutator fewer bars are required and a better mechanical structure results; the volts per inch of periphery are cut in half; flat spots, poor commutation and flashing



At the Left the New Westinghouse W-N Drive Unit for Light Weight Low Floor Cars. At the Right the Westinghouse No. 1425—35 H. P. 300-Volt Motor Used With W-N Drive.

should be practically eliminated.

The use of 300 volts gives a larger rating for a given weight and space. The 300-volt motor is very much more stable electrically and much more rugged mechanically.

The type 1425, 300-volt motor developed for the W-N drive is insulated for 600 volts. This provides for the full line voltage sometimes applied to it. These applications of the full line voltage may be due to a ground in one of the motors of a pair, or to very severe wheel slippage. The motor is designed to stand these occasional applications of the full line voltage.

It may be asked, will not these applications of full voltage cause flashing. Sometimes, yes! But it must be remembered that it is not the occasional flash that runs up the maintenance. It is the continued flashing of the same motor. Furthermore, there is a very great difference in the effect of a flash on a 300-volt motor as compared with a 600-volt motor. The small, high-speed 600-volt motor is very sensitive to flashing and the commutation is none too good. When a flash occurs the commutator may be roughened slightly. Owing to the inherent instability this provokes another flash, and another, until a definite flat spot is started. Once a flat spot starts the only cure is to turn the commutator. In fact, the operator is fortunate if the flat spot is the only damage done.

The 300-volt motor is different in this respect. When a flash occurs any slight burning of the commutator is not nearly so likely to cause another flash because of the inherent stability of the motor. The commutator has a fair chance to take on a polish and free itself of further danger of flashing. The 300-volt motor is, therefore, not only practically free from flashing, but the flashes that do occur are not nearly so likely to result in a repair job as a flash on a small high-speed 600-volt motor.

The ability to maintain high speed is important, and a factor which makes this possible is ease of passenger interchange. Low floors are most important in facilitating the boarding and alighting of passengers. The type 1425 motor with W-N drive allows 22 in. wheels to be used with 1 in. greater clearance than was formerly obtained with 26 in. wheels. There are only two steps of moderate height from the ground to the car floor. There are no ramps. Ramps increase the cost of a car and are an accident hazard. The low floor also adds to the beauty and attractiveness of the car body. These features, beauty and convenience, are important factors in producing a more saleable ride. Operating costs should be lower with the new type of equipment.

One of the most common criticisms of the electric railway industry by the ordinary citizen is that it has not changed in 20 years. This criticism has been passed on in substance by the railway operators to the equipment manufacturers. The W-N drive and the type 1425 motor is an answer to those criticisms.

The Milwaukee's Pioneer Limited, a Roller-Bearing Train with All Modern Comforts and Conveniences Including Private Rooms for the Customers. If Your Hair is Gray Think Back Over Your Railroad Years, and Compare This Train With the Things You Used to Ride.

Queer Happenings in January

WITH tears of gratitude, as she stood in the old Union station at Toronto, Mrs. McCallum of Detroit closed her hand on two diamond rings, valued at about $1,200, which she had left in a wash room on the Canadian National Montreal train, which arrived at 6:45.

Mrs. McCallum stopped off in Toronto and left the rings, one a valuable keepsake, in the washroom. She didn't miss them for an hour. Hastening back, she went to Dennis O'Leary, station master. They found the car cleaner, who said the rings had been turned into the Pullman office where Mrs. McCallum received them later. Then came the tears.

Peculiar Accidents Cause Two More Deaths

In San Francisco, Mrs. Arthur H. Muhl put her car in the garage and started to close the doors. She had fastened one when the brake slipped and let the car run backward, crushing her to death between the car and the doors.

In Los Angeles, Gus Booker, standing near a street corner, heard the screech of brakes. Curiosity caused him to turn to see what was happening. At that instant an automobile collided with a meat truck at Booker's side. Heavy meat boxes toppled off the truck and crushed him so that he died an hour later.

A Mix-up It Was in Sand Canyon

The road through Sand Canyon near Redlands, Cal., with its many turns and narrow places has been the scene of a number of queer accidents since all the traffic was routed through it while the state highway is being widened. The most recent example is this:

A New Kind of Freight Car Appears on the German Government Railroads; Looks Like the Last Word in Something or Other. P & A Photos.

The automobile club sent the tow car of the Gibson garage to the canyon to drag the automobile of Frank Helm of Rialto out of the ditch. The tow car was forced to get down in the ditch with the Helm car, which was turned over. Along came a small truck, the driver being so interested that he went too near to the gully edge and his truck toppled over on the tow car, smashing the top and half burying it. Then another truck came along and in attempting to drag the other truck off the tow car got down in the ditch. Finally it was pulled out, the truck dragged off the tow car, the tow car then dragged itself out of the mud and finally snaked the original car out and the road was clear once more.

Probably Died Waiting for the Train

German railroad officials of the refund office have deducted 10 pfennigs from the amount due on the unused ticket of a man who dropped dead as he reached his train; for, as they put it, "investigation shows that the bearer of the ticket was alive after he passed the barrier" and the platform fee is properly chargeable. Their superiors have commended them for their attention to detail; and in fact, a man who would investigate to determine whether a traveler was dead as he walked through the gate is more than attentive to detail. He is wedded to it.

And the Cow Jumped Over the Hood

Alfred Hengst of Three Rivers, Cal., was hauling a cow to the slaughter pen in a high rack on his truck, January 16, when "bossie," evidently realizing his intention, suddenly braced her feet, jumped up and down several times and cleared the rack. She then leaped over Hengst's head, landed on the radiator, kicked out both sections of the windshield and escaped.

Editorial Comment

Well, Yes and No

THE presidential campaign will have no bad effect on business. The old bogey has been laid out, buried, and in the future will be forgotten in commercial, financial and industrial circles.

Everything looks bright now, but it may not last long because 1928 is a presidential year; careful conservatism is advocated in times likely to be unsettled.

Farmers are in very much improved condition. Their crops brought them about 600 million dollars more than in other years, they have been able to take up some old notes, and have paid up some long overdue interest on renewals.

Agriculture has not yet recovered from the unfair treatment it received during and after the World War. The rural situation is so discouraging, indeed, that more than 3,000,000 persons deserted the farms in 1927 and went to town. Foreclosures on farm lands have taken the heart out of the farmers.

The relationship between capital and labor is vastly improved. Employment has increased and wages are satisfactory. Savings deposits have grown enormously, and the building and loan companies report an increasing demand for homes by the thrifty. The cost of living is going down, thank goodness.

Just what business and industry in general are going to do about the growing demands for wage increases is difficult to imagine. These demands already have almost absorbed the improved return for which investors had been waiting. The cost of living is 69 per cent above pre-war days. Unemployment is disturbing. Under such conditions no working man can hope ever to have a home of his own and enjoy the pleasures of life, if any.

Buses have ruined the passenger business for the railroads, and there seems no likelihood of ever getting back any of it. Trains are being taken off everywhere. It won't be long now until the roads will have nothing but a few limited trains on long distance runs.

Railroads have not suffered because of bus competition. The passenger business has been taken by the private automobiles. Railroads never made any money anyway out of passenger business. Moreover, the automotive industry has produced enough new freight to make up, several times over, for all the lost passenger traffic. Instead of fighting buses, the railroads are now putting them to work as feeders.

There doesn't seem to be much sense to this editorial, but it is based on alleged facts as they have been gleaned in a very thoughtful consideration of the reviews and forecasts found in the leading financial papers.

We are not expressing an opinion. We are merely reporting the news as we find it.

Obviously

Plans for increasing the consumption of California fruits and other produce by a campaign of education conducted among eastern retailers will be discussed at the twenty-fourth annual convention of the Western Fruit Jobbers' Association of America, which meets in Los Angeles January 31 to February 4, according to H. S. Hazeltine, general chairman for the convention.

Obviously, the only way to make people eat more fruit is to reduce freight rates. If people don't eat fruit then the business is poor, and when business is poor rates must be cut. Good manners forbid one betting on a sure thing or we would gladly wager that before the convention has been in session two hours someone will demand lower freight rates; the Hoch-Smith Resolution will be invoked. It never fails.

A Good Suggestion

Howard Elliott, chairman of the Northern Pacific board, said, recently:

"A broad gauged and experienced engineer upon the Interstate Commerce Commission would bring to that most powerful body a knowledge and viewpoint of very great value, and to a lesser degree the same is true of the various state commissions."

Mr. Hoover, for instance, if not otherwise engaged.

Trouble Soon on Rock Island Lines

When the Rock Island management issued orders, recently, prohibiting the use of "Hello" in answering the company's telephone calls, the idea was approved everywhere. Time and temper are saved in this way. But now, according to advices from Chicago, clubs are being organized all over that line to discourage swearing by employes.

Old railroaders will view this latest move with genuine alarm, particularly in the switch shanties. There is no telling where it may lead. With Senator Capper appealing to congress to direct the Interstate Commerce Commission to reduce rates on grain, and Senator Brookhart preparing a bill providing for government ownership of railroads, it

seems to us that any attempt to prevent swearing among railroad men is pretty far-fetched, and very likely to prove what vaudeville folk call a flop. If this kind of uplift is to be encouraged among the craft it will not be long before some moralist will ask for an order against chewing tobacco. After this only one more step remains to be taken: Someone, devoid of all appreciation of art and beauty, will ask that the walls of Rock Island switch shanties be stripped of Police Gazette pictures and portraits of Mack Sennett stars.

There are times when we wonder just what is happening to the hallowed spirit of railroading. There may be no truth in the report but it is declared currently that Rock Island employes who do not swear for 24 hours are to receive gold stars to be worn in the coat lapels.

National Income 100 Billions in 1928

The national income in 1928 will approximate 100 billion dollars, in the opinion of Warren F. Hickernell, economist, Alexander Hamilton Institute.

On June 30, 1927, the total deposits of 27,061 banks in the United States amounted to 51.3 billion dollars. Since bank deposits are increasing at the rate of about two billion dollars a year, he states, we may expect total deposits on June 30, 1928, to be around 53 billion dollars. Assuming a free turnover of assets, the national income should be at least 90 per cent greater than deposits. Figuring on this basis he arrives at the conclusion that national income in 1928 will be about 100 billion dollars.

Holding Back the Hands

Every town of importance in Germany has an airport. Consequently aviation has become popular with the people, and very largely successful. The German airports are so situated that time saved in flying is not lost again in getting mail and passengers into town.

Over here aviation is being held back through lack of airports. Even where they have been provided they are so far from postoffices and hotels that it might almost be just as satisfactory to use railroad facilities. In many places, notably large cities such as Los Angeles, the advancement of aviation is retarded by stubborn councilmen and greedy landowners.

Railroad executives must find a smile in the situation reminding them, as it will, of the experiences they have had every time they have tried to select a site for a station or to provide any other facility for the people—politics, stubborn and ignorant men, and greed.

An incomplete census of airplane manufacturers shows that in 1927 one-third of the industry, including some of the larger producers, turned out 1,525 planes, while unfilled orders totaled 1,239. When the other two-thirds of the manufacturers are heard from, total airplane production for 1927 may run considerably in excess of estimates that output would be double the 1,186 planes in 1926.

Unfilled orders and expected expansion of existing plants make it probable that airplane production in the current year will be more than twice as large as in 1927. Department of commerce officials have predicted this freely, and it has been emphasized by plans of one of the largest manufacturers for turning out 1,200 low-priced planes this year, compared with 400 in 1927. These planes sell for around $2,250 each.

It has been estimated that there are approximately 84 manufacturers in the United States engaged in production of airplanes for commercial and private use, compared with 37 in 1926. Around 900 firms are engaged wholly or partly in the aeronautical industry.

Railroads with yards and roof area on freight sheds, and the owners of high buildings can help greatly in providing landing places for planes inside city limits. In no other way can the greedy plans of landowners be defeated.

One of the primary rules of editorial writing is never to criticise a situation or condition without suggesting a remedy to improve it. In a case like this only one hope seems to bob up. It was offered once, long ago, in an eastern city whose progress had been impeded by a group of avaricious landowners. "What we need here," said one of the public-spirited men of that time, "can be provided only by God Himself: A lot of funerals; and I should like to suggest the text for the sermons: 'The Lord hath given and the Lord hath taken away; blessed be the name of the Lord.' "

The Milwaukee Reorganization

Everyone in the country except Colonel Lindbergh having spoken and written for about 18 months on every possible point affecting the receivership of the property and the thousand and one points of reorganization, the Chicago, Milwaukee & St. Paul starts life over again, with a reasonably clean slate, and a new name: the Chicago, Milwaukee, St. Paul & Pacific. Harry E. Byram, for years president of the road and co-receiver during its career in the courts, is chairman of the new board, and Henry A. Scandrett, one of the vice presidents of the Union Pacific, became president. The receivership was closed and the new deal began January 16.

The news announcement, long expected, created no great stir. The things that will live in railroad history, however, were the caustic comments of the Interstate Commerce Commission in giving its approval to the reorganization plans. The majority

gave the impression to readers of newspapers that great restraint had been exercised, although it was not immediately apparent. What did seem clear, however, was that the commissioners had gone ahead while still pulling back on the bridle, giving their sanction to something they did not entirely approve. But this fault, if it be one, should not be charged against the commission, but rather against the strange legal instruments with which that body must operate. Here we see, as in the matter of consolidations, no provision for sensible participation by the commissioners in preparing the reorganization, while the country, under the law, expects the commission to see to it that the cards are not stacked against the public.

It seems to us that in some respects the commissioners, in the majority report at least, said a good many things they might better have left unsaid. What happened in the past; the boneheaded things that were done, if any; the poor judgment or mismanagement or whatever it was, should not have been tacked to the running orders the new crew was getting for its trip. No law with which we are familiar ever gave a traffic officer the right to scold and browbeat a man for violating a regulation. But they have been doing it ever since traffic officers were created; and so have the judges, and with no more right. A court is supposed to hear the testimony and, where there is no jury, give the decision. The rule ought to apply to the commission in Washington.

The Short Line Tragedy

It is to be hoped that congress will give heed to the appeal of the short line railroads for relief from the oppressive features of the recapture clause in the Transportation Act of 1920. The original purpose of this clause was to help the weak lines of the country, but this purpose has not been realized.

The Newton bill in the house and the Pittman bill in the senate would exempt certain classes of short or weak lines and give them a fair chance to recover. These bills would exempt three classes of roads, those having not more than 250 miles of line and earning not in excess of $10,000 a mile; those of 100 miles or thereabouts, earning not over $15,000 a mile, and those of 200 miles earning not more than $10,000 a mile, to an extent to be decided by the Interstate Commerce Commission.

Arguments in favor of the proposed legislation show that roads classed as short lines operating ordinarily with a deficit occasionally have a year of good enough traffic to enable them to pay their back bills and get another start were it not for the recapture clause. Just when things look a bit brighter the recapture clause operates and takes 50 per cent of anything the roads earn in excess of six per cent.

Few of these short lines ever have paid a dividend. Their case may be likened to that of grain farmers who, for the first time in their lives, stood a chance to get $3.50 a bushel for their wheat during the World War. About the time they began to smile the watchful government took charge of the matter, fixed the price at $2.25 a bushel, which none of them ever received, and ruined the picture.

As to Consolidations

One thing seems fairly certain, if railroad consolidations are to be effected in this generation (and this does not appear to have been the idea up to the present, eight years having elapsed since the law was enacted calling for action) the gentlemen engaged in arranging consolidations, if there are any, will make better time if they confer with the Interstate Commerce Commission occasionally.

It has been observed already in these columns that no one on earth knows just what kind of consolidation the commission will approve. Probably the commissioners themselves do not know. But the commissioners do know certainly what they will not approve. For one thing the commission will insist upon a square deal for minority share holders, and they will try to see to it that this square deal includes the public at large. How much more satisfactory it would be than in the Nickel Plate case, for example, if the commissioners and the consolidators might get together, talk over the plans proposed, and discover if possible just where they were headed.

It might not be easy, however, to get the commission to agree to this added burden. It already is more than 2,800 cases behind on its docket, and has no hope of clearing it in the lifetime of the present members. The Parker bill for permissive consolidations seems a way out of the trouble, but it leaves the old fault alive: and this is in the fact that after the railroads have worked for a year or two and spent huge amounts of money in preparation, the commission, "with a stroke of the pen," as old Judge Casey used to say, kills the project.

Doesn't it seem strange that American citizens in these advanced times—lawyers, business men, executives, financiers,—can not get together and decide anything in the interest of the common good? The objection to the get-together idea is that the commission might be overwhelmed by consolidation plans and have no time for other work. But this is merely a contribution to current humor, and should have no serious consideration.

The Southern Pacific's Costly Venture

The Southern Pacific has done a fine thing for the disturbed Republic of Mexico in providing a well managed railroad for its people, but at a rather high price. Indeed, to the present time the Southern Pacific of Mexico seems to have been about as cost-

ly a relative to support as the Pacific Electric. After going through the year's report of President Titcomb to the Mexican federal authorities the wonder grows that this great transportation company has had the courage, amounting to self-sacrifice, to continue its efforts to provide this people with the comforts and conveniences of a modern railroad.

President Titcomb says in his report that operating expenses for the first eight months of 1927 exceeded operating revenues by 882,000 pesos (about $418,000). On this statement and due to the reduction of operating service late in 1927, following bandit raids, with year-end adjustments, it is estimated that the year's net income will result in a deficit exceeding $1,000,000. This compares with a deficit of $779,934 in 1926, and a net income of $50,160 in 1925.

Since 1925 the Southern Pacific Co. has not charged against income of affiliated companies the interest on their debts to that company. This accounts for the better showing of the Southern Pacific of Mexico in that and the subsequent year. In 1924, however, with interest charges included, income account showed a deficit of $6,417,060.

The outlook of the road is encouraging, however. The company looks for gains in freight traffic both from farming and mining sources. The Richardson Construction Co., now farming about 30,000 acres in the Yaqui Valley, will begin at once to expand acreage to 900,000 acres; a Belgian smelting and mining company, strongly financed, is about to construct a smelter at Mazatlan for low-grade ores. This company will begin operations on a small scale and expand as demand increases.

Assuming a sound and stable administration, conditions in Mexico should improve rapidly. The chief danger to both investors and enterprises in Mexico is economic dislocation following political turmoil. The present administration in Mexico is distinctly friendly to the Southern Pacific. The value of this influence remains to be proved.

Equipment Purchases and Peak Efficiency

An analysis of all the abnormal conditions which may have influenced a peak period on a railroad may show that the peak operating efficiencies, as reflected in reports are not always the result of increased efficiency. Sometimes unusual conditions which influence efficiency figures of a high per cent are responsible. Such peak periods set up as goals are all right if not taken too seriously for comparison with periods when only normal conditions of business or operation prevail. To use them otherwise may be an error.

Gross ton miles or loaded car miles peak periods caused by abnormal conditions are not always safe to use in calculations contemplating expenditures for increased facilities used in connection with train operation or purchase of new equipment unless analyzed and proper deductions made. Neither are other allied operating efficiency figures shown under these conditions always safe to use. They too are often distorted.

Labor troubles such as suspension of coal mine operations sometimes extending over a period of several months, always affects the operation of the road serving the territory where mines are closed down, as well as the road serving territories where mines are working at a greatly increased output. Gross ton miles are relatively increased as a result of hauling the coal to farther distant destinations, which, in turn, affects the loaded car miles, empty car miles, per cent of loaded to total car miles, and the average miles per car per day. Under these conditions the seeming increased efficiency reflected in the last named item may be very materially increased on the road where mines are closed down as it is relieved of the one and two car days on each load that it takes to spot the car in mine, load, pull and assemble in yards for road train movements.

Similar freak efficiency figures may show up in operating statistics as a result of an unusual congestion or other conditions causing the diversion of a large volume of business out of regular routes to some individual railroad. Under these conditions the road receiving the diverted business may show a large increase in the per cent loaded to the total loaded and empty car miles, as a result of not hauling the original empty cars for delivery to the originating road, for the loading they received in the diversions. And when these cars are returned many of them follow the natural movement of being loaded back to owners via many diverse routes, thus affecting very materially the return empty haul or empty car miles.

Figures covering periods of heavy seasonable traffic should also be considered very carefully in contemplated improvements and purchases.

Equipment purchased on a basis of a freak peak period, or one purely seasonable only one or two months in the year, may cause some of it to lay idle the other ten months, the "fixed charges" as result of such investment may be very materially increased, and if charged to the peak period, may show a real loss.

Getting Down to Truth

Through the Hearst papers, recently, you probably heard about the profits the government was making out of its ships. These profits were so generous that congress was to be influenced in this way to grant increased appropriations.

Now we begin to get down in the basket among the real facts. For the nine months ended September 30 last, the U. S. Shipping Board reported a

loss of $502,337 for its vessels in the South Pacific against a loss of $294,806 in the North Pacific. The vessels assigned were 19 for the South Pacific and 17 for the northern ocean. The Gulf district showed a loss of $3,385,000 with 197 vessels. Figured per vessel, the respective losses were $17,000, $26,000 and $31,000.

Quite naturally, the Seattle chamber of commerce is interested in these figures. The Seattle chamber demands that the government sell all its vessels—except those in the navy—get out of the business and stay out.

A letter received a few days ago from a ship owner at San Pedro asked us to tell him why the people are taxed to maintain government competition with private owners of ships. The letter reached us on one of our dull days. We can't answer it.

The Farmers Still Wait

Early in young manhood the resourceful and ambitious Arthur Stilwell determined to go into the Middle West and build a railroad to relieve the wheat farmers of the burden of high rates imposed upon them by conscienceless corporations. First, however, he sold a lot of insurance, and this delayed him a great deal. But eventually he built the road—two of them indeed. Holland and England provided most of the money.

Mr. Stilwell is telling the story serially in the Saturday Evening Post with the assistance of a gentleman well trained in the mechanics of writing. One of the rules of the game is that the suspense must be maintained, and this may account for Mr. Stilwell's failure, up to the present, to disclose the secret of rate cutting. The story is absorbingly interesting, particularly for railroad men and farmers. The real climax will come when the rates are slashed. Don't miss it.

Lindbergh—He Helps Others

When Colonel Lindbergh flew into Mexico City, one day last month, the correspondents of the newspapers had something to say about it. The Western Union Cable Co., alone handled 34,000 words, and no one at present knows how many other thousands went over the land lines of the government telegraphs. Still other thousands of words have been sent out every day and every night about the young man's movements, and thousands of silly protests against his attending a bull fight. Following this came columns about Mrs. Lindbergh's flight from Detroit to Mexico to spend Christmas with her son. Lindbergh certainly must have created a lot of good will among the telegraph companies any way.

But this was only a part of the good Lindbergh did by going to Mexico. He demonstrated anew the theory that a competent pilot can fly great distances in an orderly way. Indeed so firmly has he gained the confidence of the people that the President of the republic took a sky ride with him and saw his country for the first time from the air. In this connection it is interesting to read that an insurance company insured Lindbergh for $110,000. He must be considered a good risk.

Employe Cooperation in This Fuel Record

In the last six years the railways of the United States have reduced their locomotive fuel bill about 300 million dollars. This is cooperation of the employes in its highest sense led by officers in whom they have confidence. The total cost of the fuel used yearly by steam locomotives is now about 400 million dollars, while in 1920 the total was almost 700 million. Part of this reduction, of course, is due to lower prices, but a very large share in the savings effected is due to increased efficiency in the use of coal. These savings, and other similar ones, have made possible the general freight rate reductions which have occurred since 1920.

More than 100 million tons of coal and more than two billion gallons of fuel oil were consumed by railway locomotives in road service alone, excluding switching service. Figures for the first six months of 1927 show a consumption in this period of 49 million tons of coal and 998 million gallons of fuel oil.

The Editorial of This Edition

THE first fast passenger train between San Francisco and Chicago, in 1869, shortly after the connection had been effected at Promontory, made the trip in 126½ hours. People boasted about it. Now the journey is made over the same route by the Overland Limited in 63 hours, and there is a loud wail of protest if the train arrives 30 minutes late, which doesn't happen very often, by the way. You can go to Chicago by air, if you are in a great hurry about something, in 20 or 22 hours, and to New York in 30 hours. Indeed, you can fly to the Atlantic seaboard now and get back to the West Coast in several days less than it used to take to go to Chicago by rail.

There were no dining cars on this first fast train. Passengers ate in hotels along the way, and here the national indigestion was founded. If you went to New York you made the trip in six days and nights. You couldn't get a bath en route, or have your hair cut or get a shave or a permanent wave, or have your clothes pressed, and when you arrived you looked like a tramp, and smelled like the waiting room in a country station.

First class fare to Chicago was $130; to New York $150; St. Louis $129, which shows, to our way of thinking, a bum division of rates. Passengers were permitted 100 pounds of baggage free, but paid $15 a hundred for excess. Nowdays the ordinary fare to Chicago is $90, but the round trip costs only $86 in the summer. In 1869 a berth, lower or upper, from San Francisco to Ogden cost $6 and a stateroom $12. From San Francisco to Ogden a lower berth now costs $9; to Chicago $23.63, and for an upper $18.90.

Consider the difference: The fare now is lower, Pullman rates some higher—not forgetting the well-known surcharge which Pullman passengers are entitled to pay—you lose about two business days in making the trip; you may have all the comforts of home while traveling, and several not found in many homes. You will have the latest news every day. Books and papers. Lounge, dining, observation, parlor—all kinds of cars, even to those having private rooms with real beds big enough for two Ford models or one, if built on limousine lines with Fisher body. And you reach Chicago about 63 hours quicker than in 1869. You may be broke, what with extra fare and this and that, but at all events you'll be there, and you'll be fit for good society when you arrive.

A Central Pacific schedule of 58 years ago shows there were through passenger trains every day from San Francisco, and once a week, on Wednesday, the "Atlantic Express" left that city for the East. For the ordinary through passenger train the time between San Francisco and Omaha was four days and four hours; to Chicago, five days and six hours; and to New York, seven days. The Atlantic Express, however, made the trip to Omaha in three days and eleven hours; to Chicago, in four and one-half days; and to New York, in six days.

"O, well, we could've made it in less time," said one of the oldest of the retired engineers, a few days ago. "But why should we? We were beating everything on earth as it was. We just didn't choose to run faster."

Since the foregoing paragraphs were written the railroads have announced another reduction in the time between the Pacific Coast and Chicago for eastbound extra fare trains. The running time on these extra-fare trains of the Southern Pacific, Union Pacific and the Atchison, Topeka & Santa Fe will be reduced one hour and forty-five minutes early in March, said the announcement. The westbound schedule will remain unchanged.

Another announcement even more startling comes from New York telling the speed-eager world that eight large railroads are planning to provide fast airplane service between train terminals. Fairfax Naulty, New York aeronautical engineer, is the authority quoted. Naulty said the railroads plan to use space above terminals as yards for landing platforms and thus provide a new public service for handling passengers, mail and express.

"Complete plans have been formulated for a Boston to Washington route and other plans are being worked out for lines from New York to Chicago; New York to Albany to Montreal; Philadelphia via Pittsburgh to Chicago, and Washington to Chicago and St. Louis," he said.

"This type of air service will be owned and operated by the railroads."

So, by and large, as Sam Blythe would say, the railroad men are wide awake, watching every opportunity to improve their service. Now, if they will provide an easy way to open car windows, and make it a crime for locomotives to whistle when passing the Pullmans at night nothing more, reasonably, can be asked to make life one grand sweet song.

The Santa Fe's Growth

One of President Storey's public statements, issued last month, showed the Santa Fe has about 75,000 employes! In 1870 this road had 42 miles of main line. Now it operates nearly 12,000 miles. In 1870 its gross operating revenue was $182,579. Gross operating revenue in the first eight months of 1927 amounted to $132,172,113. In 1870 the road's freight earnings were $110,754, its passenger earnings $71,825, and it carried 33,628 passengers. In 1926 it spent nearly seven times as much for stationery alone as its gross operating revenues amounted to in 1870.

Nearly 5,000 more women than men own stock in the Santa Fe which seems to offer one more wholly unnecessary proof that women aren't so dumb. The men own more stock, but they buy things before they go home. The 25,939 men shareholders own 1,375,934 shares and the 30,083 women 995,357 shares.

Watch Out for Chicago

A recent decision of the United States Supreme Court has stirred up the coroner of Cook county most of which is in Chicago. The court said a railroad is not liable for property damages in grade crossing accidents. Now the Chicago coroner says that when the next "appropriate" accident occurs he will arrest the train crew and hold the men for the grand jury. This used to be the custom in Mexico.

Rushing to the rescue of "Miss June," a London stenographer who had made a parachute drop into a tree, a crowd recently found her sitting on a bough unhurt and smiling happily.

Words, Just Words at Washington

However, This Delays Action

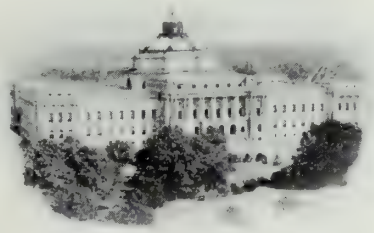
By W. E. Hopkins

ALTHOUGH there was considerable activity in Washington in January with respect to proposals affecting one form or another of transportation, it was apparent that as to whether or not there would be final action on them in the near future was a matter for conjecture.

The interstate commerce committees of the senate and the house alternated in holding hearings on proposed railroad consolidation legislation. Alfred P. Thom, general counsel of the Association of Railway Executives, and R. C. Fulbright, chairman of the legislative committee of the National Industrial Traffic League, testified before both committees, and urged that action be taken promptly on the bills introduced by Senator Fess of Ohio, and by Representative Parker of New York, chairman of the house committee on interstate and foreign commerce. Mr. Fulbright approved the proposed legislation subject to the proviso that congress make it plain in the law that consolidations or unifications approved by the Interstate Commerce Commission were not to result in substantial reduction of carrier competition. It was expected that the hearings on the proposed legislation would continue for some time.

Pleas of short line railroads for exemption from the recapture provisions of the rate making section of the Transportation Act were heard by the house committee on interstate and foreign commerce in connection with consideration of the bill introduced by Representative Newton of Minnesota, providing for such exemption. Witnesses for the short lines emphasized the unfairness of the government's taking net earnings in excess of 6 per cent from a short line in one year when in other years its earnings were far below that rate of return. The committee has the bill under consideration.

The senate passed the Jones Merchant Marine bill by a vote of 55 to 31. Opponents of the measure charged that the bill committed the government practically to permanent government ownership of the merchant marine. The bill provides that the shipping board may not sell vessels or lines of vessels except by unanimous vote of all the members. It also authorizes a ship construction replacement program. No money is appropriated by the bill but if it is finally enacted, the plan is to bring forward a proposal to spend about $250,000,000 for new ships over a period of 10 or 15 years. President Coolidge is opposed to the bill. The belief prevails that if the house should pass the bill, the President would veto it. It is believed, however, that the house may make substantial changes in the measure, and that possibly it may not act on it.



Library of Congress.

The advisory board of the Inland Waterways Corporation has been studying the situation with respect to increasing the facilities of the government's barge lines on the Mississippi and Warrior Rivers, and of increasing the capital stock of the corporation. When the board has completed its studies and makes a report to the secretary of war, it is expected that definite recommendations will be made to congress by the secretary.

Motor vehicle operations for transport of passengers and property over public highways should be regulated by cooperation of the federal and state governments under supervision of the Interstate Commerce Commission, it was held in a special report.

Leo J. Flynn, attorney-examiner for the commission, who heard the evidence, recommended the regulatory system and suggested legislation necessary to make it effective.

Transportation by motor vehicles operating as common carriers is "a well established, useful and permanent factor in the nation's transportation system," Flynn's report said. While railroads have suffered from competition, "they have no more economic right to any traffic than had the canals and stage coaches which once opposed railroad construction," the report said. The report held regulatory intervention by government is necessary to avoid economically wasteful rivalries. It suggested state regulatory commissions take original jurisdiction and that joint boards representing two or more states with representation from the Interstate Commerce Commission should act when operations extend across two or more state lines. From the decision of such boards right of appeal to the Interstate Commerce Commission would be allowed.

Doubtless, You've Seen Plenty of Track Like This.

But Here Goes the Fairmont Weed Burner, and—

Look at the Difference! Weeds All Gone, Track Clean.

Burning Weeds From the Track

Using a section gang to cut weeds just when every hour's labor should be put in on tie renewals or raising low joints is costly for railroads. It just happens, too, as a beneficient arrangement of Providence, that the earth is in the most workable condition for the men at the time the weeds are right for cutting. The Fairmont weed burner, then, came along as a welcome friend. Already the Northern Pacific is using eight, the Chicago & North Western five, and the same or larger numbers are in service on the Southern Pacific, Rock Island, C. & E. I., Missouri-Kansas-Texas, Chicago Great Western, and other lines. Operating cost has been found to average $3 and $4.50 a mile on these roads.

The weed burner is a single compact unit mounted on one set of wheels equipped with two Red Seal Continental four cylinder H-9 industrial motors each developing 20 brake horsepower at 1,200 r.p.m. One of the engines is used to propel the machine and the other drives the blower which supplies the burners with air. The blower engine can be quickly geared to a pump to transfer fuel from tank cars into the tanks on the weed burner.

The burner is equipped with six burners placed across the machine and inclined downward so that a continuous blast of intense heat is spread across the tracks for a total width of 16 feet. The velocity of the flame is not interfered with in any way. The blast from each burner is pointed directly toward the weeds at an angle which insures the hot tips of the flame pentrating to the matted roots. The burner oven is low, therefore, the heat is confined near to the weeds. It also is long, hence the time interval of flame exposure to weeds is sufficient to kill them while track speeds are higher. The oil burners will use a wide range of oils, gas oil, furnace oil, distillate, or kerosene.

The fuel tanks have a capacity of 475 gallons each or a total of 950 gallons, which is sufficient to operate the machine for 30 to 40 miles under ordinary circumstances. The fuel consumption is from 20 to 30 gallons a mile, depending upon the character and density of vegetation. The burning speed is about five miles an hour. The machine has a traveling speed of 20 miles an hour for making clearings and moving from one line to another. The Fairmont destroyer has been especially successful in destroying weeds on the shoulder of the bed. This is accomplished by a special blower that directs a flame with intense velocity along the edge of the shoulder.

Forgotten Now Apparently

"Having always been of opinion that the best preservative of the union of the states is to be found in a total abstinence from the exercise of all doubtful powers on the part of the federal government rather than in attempts to assume them by a loose construction of the Constitution, or an ingenious perversion of its words," wrote Martin Van Buren, the eighth President of the United States, "I have endeavored to avoid recommending any measure which I had reason to apprehend would, in the opinion even of a considerable minority of my fellow citizens, be regarded as trenching on the rights of the states or the provisions of the hallowed instrument of our union. Viewing the aggregate powers of the federal government as a voluntary concession of the states, it seemed to me that such only should be exercised as were at the time intended to be given."

Ninety-six per cent of the 54,318 rural mail routes in the United States have been motorized.

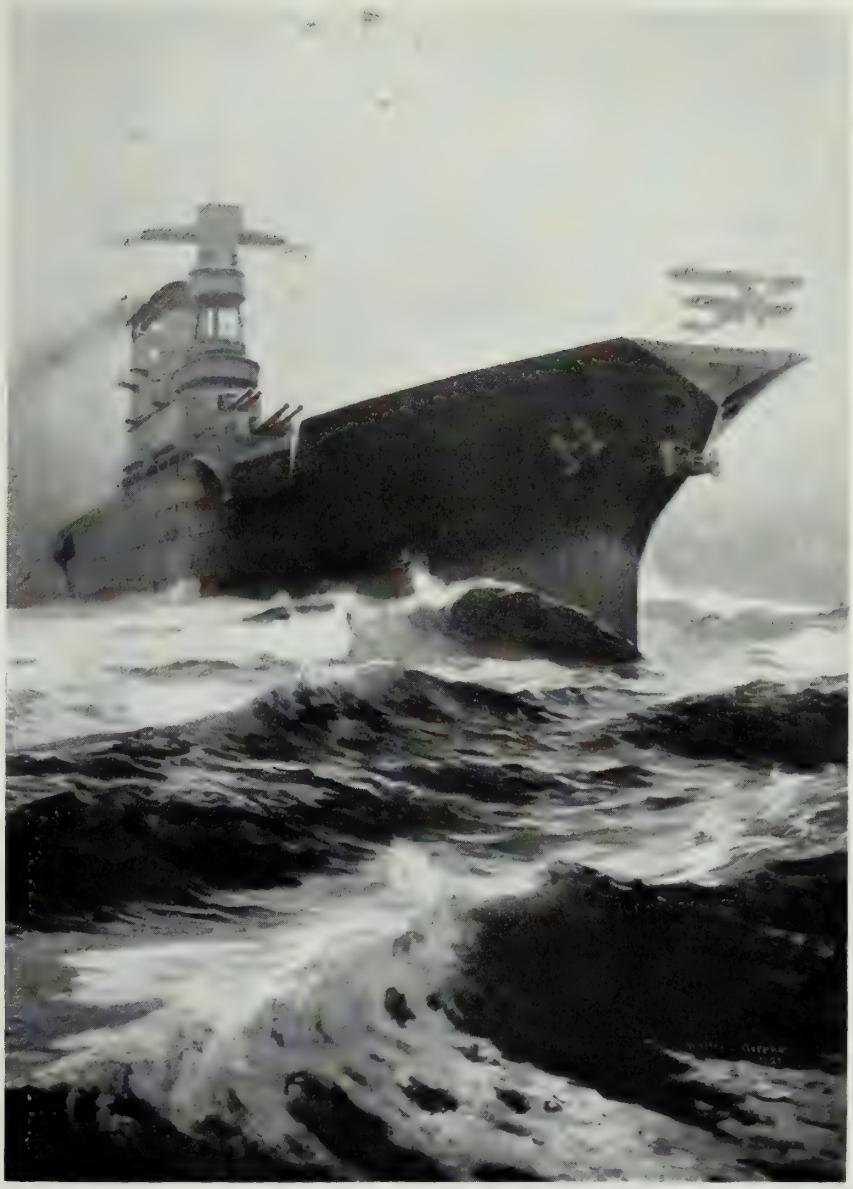
Life, however short, is made still shorter by waste of time.—Johnson.

Will Railways Take Air Transport?

A Plan Readymade

By

H. H. Thompson



This Is the Saratoga, the United States Navy's Airplane Carrier, Recently Commissioned, One of the Most Powerful Vessels Afloat, and the Speediest.

IT IS quite probable that as soon as the airplane has established itself as a practical and safe means of transportation, the great railroad companies of the United States will become interested immediately, and either start competing lines or absorb the new transportation lines, establishing thereby the greatest and quickest form of transportation the world has ever known.

Greater advance no doubt could be made if the railroads had an early appreciation of the great possibilities of the airplane and shared in its early development. Assuming that the railroads, sometime in the future, will operate the air transport lines, then the great airports would be operated not by the cities or municipalities but by the railroads. The cost of taking over these lines and airports after the development stage has been completed will be enormous. Would it not, in view of past experience, seem more logical and economical for the railroads to enter this field during the early developments? The airports would, under this arrangement, be developed by the railroads along the lines best fitted to meet the needs of transportation. Certain cities, because of their standing as great railroad centers, would become great aviation centers. Following this line of thought each town and city can judge as to the future of its airport.

On the assumption that the air mail, express and passenger lines of the future are under the control of the railroad companies, it is not difficult to picture the location and general construction of the terminal airports. The airport will be near or on the main line of the operating railroad company, probably eight or more miles from the heart of the city. An express

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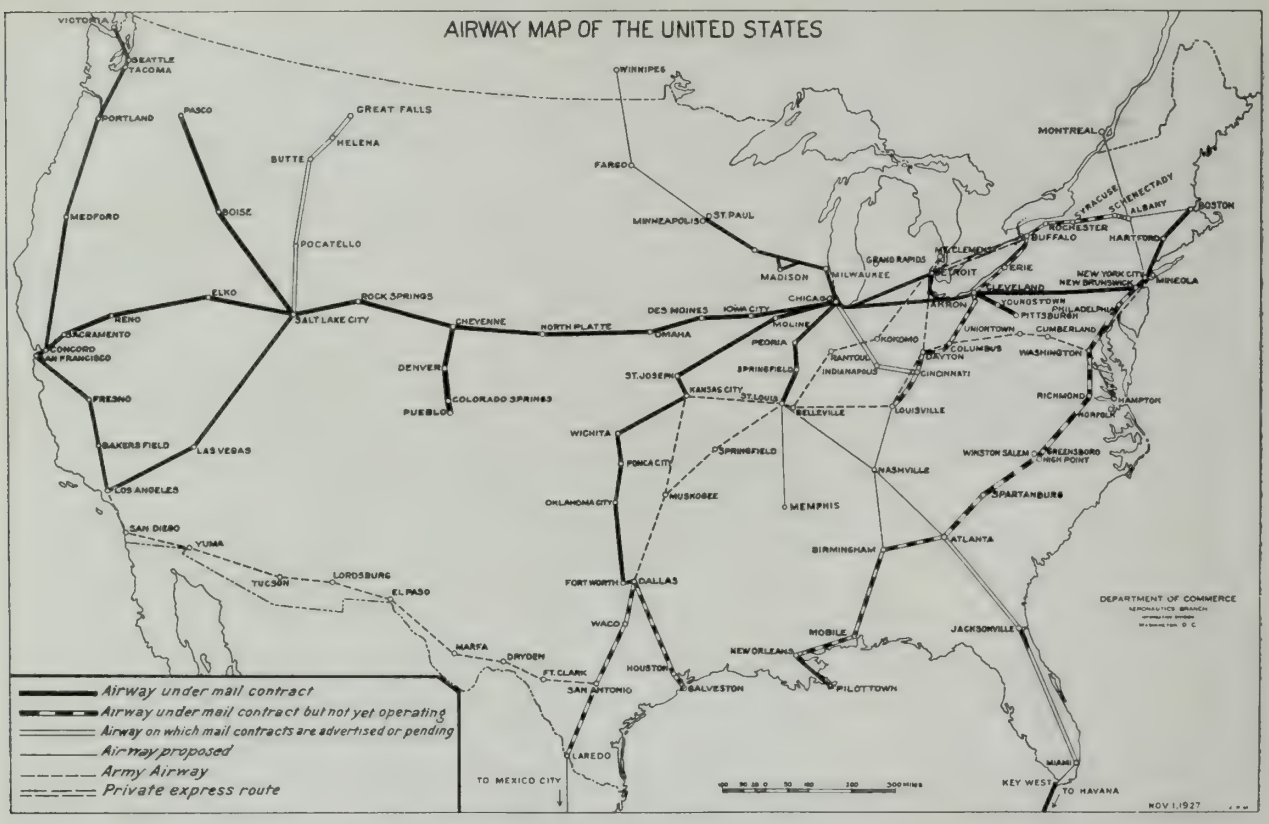
Mr. Thompson is an aeronautics engineer employed by the Westinghouse Electric & Mfg. Co.



train will carry passengers, mail and express to and from the airport from and to the railroad terminal. This airport will not be available for the use of privately owned planes. Elaborate signaling systems will be installed at each of these airports for the control of traffic. The following cities, because of their present standing as railroad and shipping centers, should therefore locate and set aside one or more sections of ground large enough to qualify in the future as an "AAA" airport. (Dept. of Commerce specifications available on application.)

Boston, New Haven, New York, Philadelphia, Chicago, St. Paul, Memphis, New Orleans, El Paso, San Francisco, Washington, D. C., Baltimore, Norfolk, Buffalo, St. Louis, Omaha, Birmingham, Denver, Seattle, Los Angeles, Pittsburgh, Cleveland, Detroit, Cincinnati, Kansas City, Dallas, Atlanta, San Antonio, Portland, Ore., Salt Lake City.

In determining the number of airports to take care of future transportation requirements, a study should be made of the present railroad requirements, for the handling of traffic between distant cities. Short hauls still will be handled by the railroads while long hauls will be handled by planes supplemented by the railroads.

In addition to the airports mentioned others will be required for local owners of planes and visiting planes. These ports should be laid out to meet the requirements for a Class A airport. It probably would be desirable to locate these ports as near the railroad airport as possible, as in all probability there will spring up taxi-plane service between the city airport and outlying towns.

Every town or city not mentioned here should establish an airport which, as far as area is concerned, should meet the department of commerce requirements for Class A rating. The development plan for these ports should be spread out over a period of years rather than over a single year. Each field should be equipped at once with a small office with communication facilities, boundary, approach and obstacle lights, floodlights automatically operated, if the field is unattended, illuminated wind cone and revolving beacon. Other equipment and facilities can be added as the demand arises.

There is a possibility in the future of airplane builders erecting assembly plants at the airports for assembly of planes prior to delivery to customer. Aviation schools will establish themselves at the airports and be a means of securing revenue for maintenance of the port. The number of privately owned planes will increase with the number of places which will enable them to land and take off. These will require hangars, the rental of which will be a source of revenue. Until such time as the airplane design becomes standardized, it is unwise to erect hangars unless a demand exists. A hangar erected today may be too small or of the wrong proportions a year or two from now. Expensive hangars are not justified in the present state of aviation; neither is expensive floodlighting equipment justified unless the airport is ex-

tensively used for night flying. The development should allow for easy expansion. The hangars, if erected, should be of such design and construction that alterations can be easily and inexpensively made to meet new conditions. The floodlighting system should be flexible and be capable of expansion at a minimum cost.

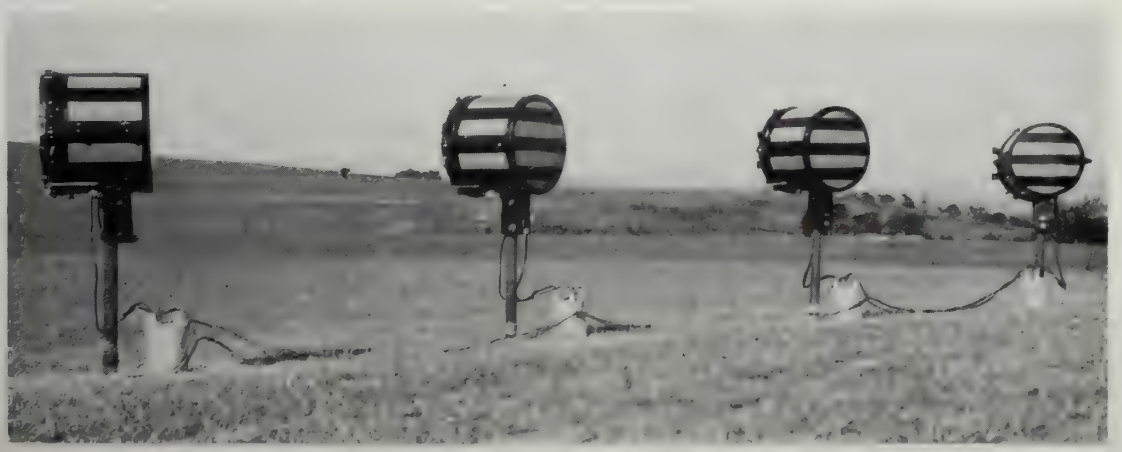
In general the demands on a large majority of airports for night flying will be such that it will not be necessary to illuminate the whole field but only that part of it sufficient for the landing of one plane at a time. It is, however, very important that, regardless of the amount illuminated, the illumination be such that all irregularities of the landing area are shown clearly. A pilot landing on a strange field at night will assume that all shadows cast on the field are ditches or holes, even if the shadows are due to slight irregularities in the field which are not serious for safe landing. The only system of lighting which can be arranged properly to light up an uneven area is the distributed system. This system has another advantage and that is it can be increased easily so as to illuminate more area with minimum cost. Its first cost is low and it has a minimum maintenance cost. It has a distinct advantage over the single source in that the burning out of one lamp will not affect the illumination of the field seriously at a critical time.

Westinghouse Airport Flood Light Projector.

The units used in the distributed lighting system lend themselves readily to the changing requirements of an airport. Lamps ranging in watts from 900 to 3000 can be used without changing any of the mechanism of the projector. A wide or narrow beam can be obtained simply by changing the lense. Where the landing areas or runways are long and narrow, and are near the edge of the airport, projectors having a short throw and wide beam spread should be used. In case the landing area is increased in width at any time the lenses of the projectors may be replaced with ones having a narrower beam spread. The size of the lamp may also be increased to give greater illumination. The cost of such changes is relatively low. The projectors may be arranged in a group to duplicate the lighting effect of a single source with the added advantage previously mentioned that, in case one lamp fails, there is still sufficient illumination by which to land.

Installations using the projector shown in Fig. 1 will be found at the following fields: St. Joseph, Mo.; Springfield, Ill.; Hartford, Conn.; Bettis Field, Pittsburgh, Pa.; Bolling Field, Washington, D. C.; Spokane, Wash.

The installation at St. Joseph consists of five projectors spaced 300 feet apart along one side of the airport. This airport is typical of many airports that will be established all over the country. While there is no night flying carried on at this field, nevertheless the city has seen fit to install the minimum number of floodlights to take care of possible immediate needs. As night flying increases, this airport equipment may be increased at a small additional expense and the present installation may be rearranged to suit new conditions at a very low cost. The installation at this field is shown in



A Group Installation of Westinghouse Flood Light Projectors for Airport Illumination.

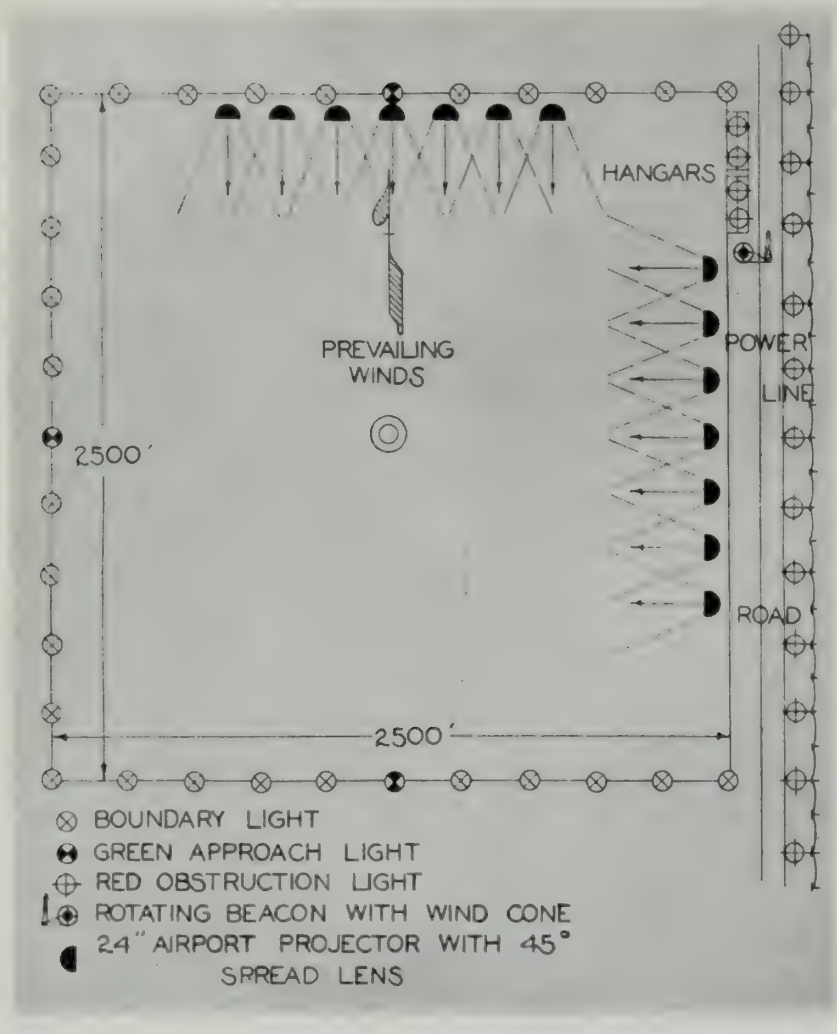


Fig. 2. Only one hangar has been erected at this port, half of which is occupied by the National Air Transport Co. This hangar is built of steel frame work and is enclosed with corrugated sheet iron.

Imperial Airway's Show a Profit

By G. K. McCabe
Yale University

At the third annual stockholders' meeting in London there were many cheers, cries of "hear, hear," and much pounding of canes and umbrellas when the chairman announced, not a dividend or a prospect of one, but the fact that Imperial Airways had earned an operating profit of $260,000. This is a return of about 17 per cent on the investment of $1,500,000. All the earnings and some additional capital collected from the stockholders are used to finance the extensions of the company. A line from India to Egypt is to be established as soon as the permission of the Persian government can be obtained.

In the same neighborhood the line from Cairo to Basra in Mesopotamia has proved very successful. The weather is so favorable to transportation by air that 100 per cent regularity is maintained as compared with 92 per cent for the cross channel service. Nearly half the mail to Mesopotamia is carried by the Imperial Airways.

For the company as a whole an increase of 5,000 passengers were carried, 75 tons of goods and ten tons of mail. Other encouraging factors are the 21 per cent decline in maintenance expense in one year, and 31 per cent since 1924.

On the other side are the competition from the lines heavily subsidized by the French government, over $3,000,000 in 1927, and by the German government, $6,000,000 in 1927; the spectacular charges for obsolescence, 12 per cent in 1927; and for depreciation, 8 per cent in 1927 on planes and equipment one third of which is less than one year old.

The directors bid the stockholders take heart from the finding that the cross channel passengers are no longer almost entirely American tourists. The load has become 45 per cent British beef by actual count. The Americans favor this line because no passenger has ever been killed while in the care of the Imperial Airways. The only fatality during the past year was the death of a pilot while off-duty testing a racing plane.

In spite of the financial improvement shown during the year (the chairman made bold to say early in the meeting that extensions of service can soon be made without further subsidy) the final huzzah was brought out by this proposal: "That this meeting considers that the present government subsidy is inadequate for the services rendered and that it should be increased substantially."

Wanted: An Air Dispatching System

The Bell Telephone Company's laboratories are trying to develop a dispatching system for airlines analogous to systems used by railroads. The development of electrical communication with airplanes to the point where they may be constantly guided on their courses in unfavorable weather and warned to avoid storm areas, is sought, using both wire and radio.

Regarding this development as one of the most important steps in increasing the reliability of air transportation and the safety of passengers the company stated it

had included in its program for 1928 "a substantial amount," to be devoted to the work by the Bell authorities.

Airports and Railroads

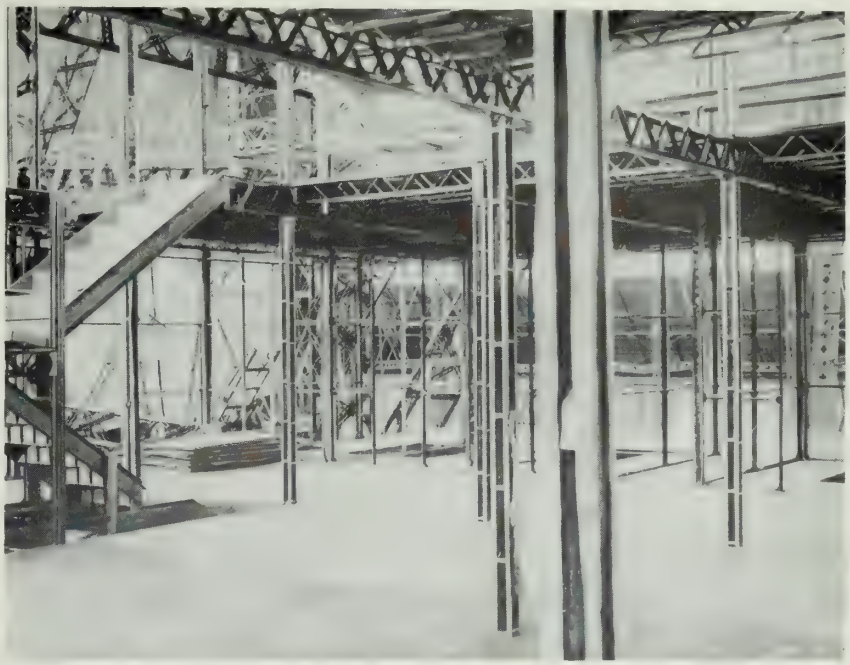
I believe very strongly that the air service of the future will be used to a great extent as an adjunct to railroad service somewhat in a similar way as the automobile truck is used today, only that the automobile truck takes the short haul whereas the airplane would take the long haul. You can see, therefore, that with this in view proper and adequate railroad connections are vital if we are to look ahead into the future. This applies to all airports, but more especially to airports of large cities or centers.

Naturally the airport is something more or less new and comparatively little advancement has been made in this field, but as it is and will be of great importance for the future I again wish to urge that proper weight be given in the selection of sites to adequate and properly planned railroad connections, for passengers, express, mail and freight delivery.—L. A. Jenny, Consulting Engineer, Dumont, N. J.

Reckless Pilots Are the Killers, He Says

The enthusiastic but ignorant pilot in a rickety old "crate" misnamed an airplane needs to be eliminated to establish flying, in the mind of the public as a safe venture, said Clarence M. Young, director of the bureau of areonautics, department of commerce, addressing the National Airplane Conference Dec. 14 at Chicago.

The unlicensed pilot and unlicensed machine are the "killers," he said, citing that of 165 accidents investigated by the department since January, 1927, 132 involved pilots not licensed by the department and 146 involved unlicensed planes.



Resembles the Steel Construction for a Modern Building, Doesn't It? But It's One of the Decks of the R-100, British Dirigible Now Building for Mail and Passenger Service Between England and the United States; the Restaurant Floor or Deck Is Shown. Wide World Photo.

Airplane production in the United States reached a new peak in 1927, the commerce department announces. In 1926 American manufacturers produced 1186 airplanes and during the first 11 months of 1927, reports from one-third of the airplane builders indicate a production of 1525 planes, with 1239 unfilled orders on hand.

Another thousand miles has been added to the system of lighted airways in the United States with the installation of the last aerial beacon on the Chicago-Kansas City-Dallas air mail express and passenger route. This will make 3041 miles of lighted airways in this country under the control of the department of commerce. The transcontinental airway is 2665 miles long, 2401 miles of which are now lighted. The Dallas line is the principal feeder route.

At present the mail, express and passenger planes of National Air Transport, the operating company, are flying the Chicago-Dallas route by day, but a night schedule is contemplated when the lighting is completed, and when the air-mail routes from Dallas to Galveston and San Antonio begin operations.

Planes operated by the Boeing Air Transport, Inc., flew 134,408 miles without accident during November while carrying out the company's contract to carry mail from Chicago to San Francisco. The planes carried 52,108 pounds of mail and flew 43,357 passenger miles to carry a total of 74 passengers.

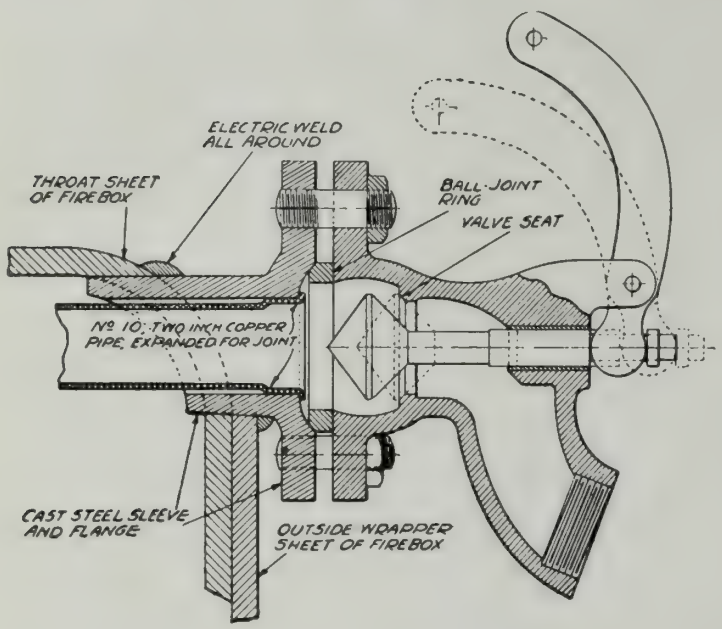
The department of commerce report, recently issued, shows that during the first six months of 1927 12,377,933 miles were flown and 395,646 passengers were carried. This does not include private plane mileage.

For the six months referred to airway operators covered 2,642,364 miles and carried 1819 passengers on schedule time. Also they covered 362,249 miles, carrying 8,305 passengers, on miscellaneous trips.

There's one nice thing about airplane travel. The roar of the motor drowns any comment from the back seat.

B-A-CO.'S SLUDGE REMOVER

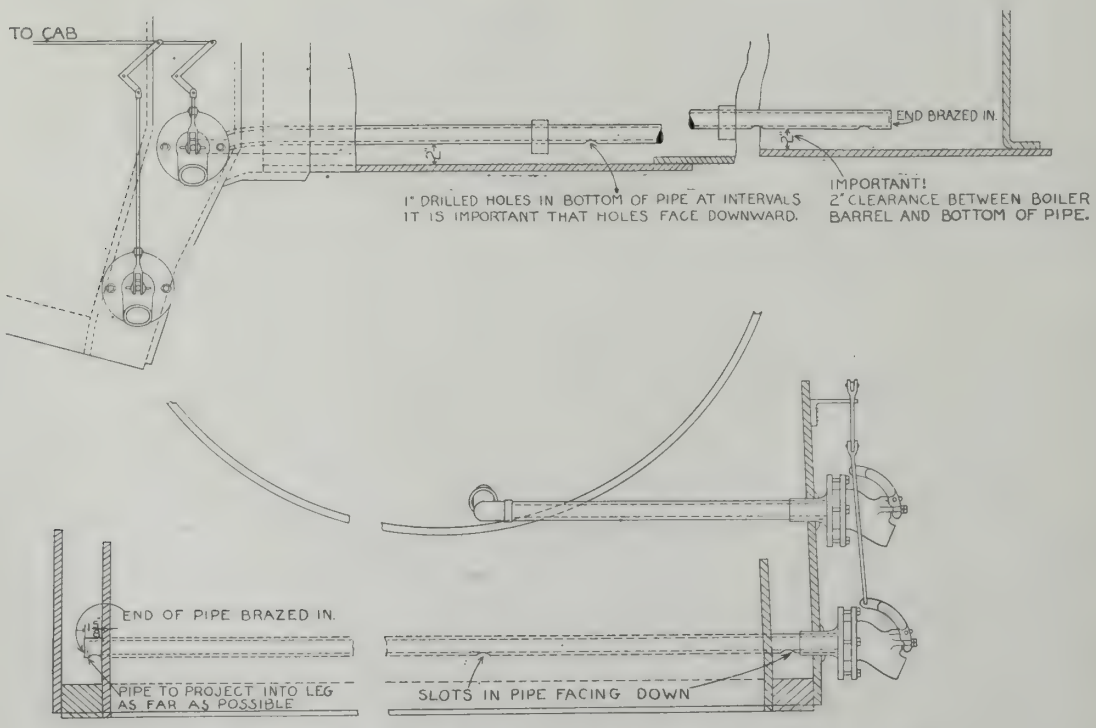
MEANS—Better Engine Performance—Less Fuel Consumption



Details of Piping and Mounting of Apparatus

A CLEAN boiler, like a clean conscience, means freedom from a lot of worry. Every locomotive man knows what these troubles are: Scale formation, foaming, corrosion, boiler tube and firebox leaks.

It is also realized that removal of the sludge, even with the blow-off cocks alone, will greatly relieve these troubles, especially where chemical treatment to throw down scale-foaming solids is used. The B.-A. Co. Sludge Remover multiplies this relief many times over.



THE BIRD-ARCHER COMPANY

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Little Stories About Big Men

The Late Major-General Goethals, Builder of the Panama Canal.
—Keystone Photo.

WHAT are declared to be the inside facts about the building of the Panama Canal was told not very long before his death, January 21, by General Goethals to whom the full credit always has been given for that great achievement. It was characteristic of this really big engineer to pass the credit on to someone else, and in this little story, told in confidence at the time, he handed the flowers to the late President Roosevelt and to John S. Stevens, who preceded Gen. Goethals as chief of construction in Panama.

"Stevens did half the work before I ever got there," Gen. Goethals said. "But after I arrived my moves were checked at every step by a commission that was supposed to supervise things. Finally I explained the situation to the President and he ordered me to Washington to talk things over.

"He agreed that the only way to get the canal built was to put me in complete charge. He directed me to draw up an order shearing the commission of some of its power, but both Mr. Taft, then secretary of war, and attorney-general Bonaparte, said the order never would be upheld by any court.

" 'We've got to get this canal built,' the President almost shouted. 'If I sign this order are you sure you can do the job?'

"The upshot was that the order was signed and I went back to work. There was little trouble from the commission after that."

After the Panama Canal was opened in 1914, General Goethals served for two years as governor of the Canal Zone, then requested retirement that he might withdraw to civilian life after more than 30 years of military duty. During the World War, however, he was recalled to active service with the army and was given several important missions. He served for a time as general manager of the

The Funeral Train that Bore the Late Marvin Hughitt to His Final Resting Place. -P & A Photos.

Emergency Fleet Corpn., and in 1917 was appointed acting quartermaster-general. He received the Distinguished Service medal from congress.

He was again relieved of activity in 1919, whereupon, he organized in New York the firm of George W. Goethals & Co., engineers and constructors. He was decorated by the French government with the Order of Commander, Legion of Honor, for his service in the war and received various medals and decorations from scientific societies for his contributions to engineering.

But of course no story about General Goethals and the Panama Canal would be complete without naming the late Major-General William Crawford Gorgas, chief sanitary officer of the Canal Zone, the man who "cleaned up" the isthmus, protected the lives of the workers and made the digging of the "big ditch" practicable.

After seven years of unremitting labor, during which he met and conquered almost unbelievable obstacles of nature and science, General Goethals reported to the congress of the United States that the two American continents at last were separated by a navigable waterway.

When news of General Goethals's death was received at Balboa it caused profound grief, and flags were placed at half-mast.

Story after story is being retold, recalling the old construction days, none of them more fondly remembered than the Goethals Sunday-morning courts, when "the colonel" judged high, low, white and black, executive and office boy, personally adjudicating their complaints.

Others recall how in the early days the womenfolk complained of the bachelors appearing on Sunday mornings on the verandas clothed in their B.V.D.'s. Maj.-Gen. Goethals told them:

"These men are building a canal and I need them. There is a boat sailing Thursday and accommodations can be arranged for you if you wish."

Ralph Budd, president of the Great Northern Ry., was closely associated with General Goethals in the building of the great canal.

"The Panama Canal always will be General Goethals's monument," said Mr. Budd. "He carried to a successful and brilliant completion that work which had been begun by others, and in doing so proved himself one of the greatest executives as well as engineers of all time. The qualities of even-handed justice and firmness, tempered with human sympathy, won for him among the employes on the Isthmus the title of Benevolent Despot of the Canal Zone.

"My two and a half years of service under him was one of the richest experiences of my life and I am glad to join with the multitude of others who served with him in testifying to his great leadership, and in mourning his passing."

Old timers in railroad telegraph circles still tell the story of the late Marvin Hughitt's "long trick" as a dispatcher. Hughitt, a power on the Chicago & North Western for more than 50 years, started his working career as a telegraph operator, as so many successful men have done. Up to the time he became a trainmaster on the Illinois Central his rise in the operating ranks had been no skyrocket progress. Steam transportation in those times was still rather new;

Hughitt, as history shows, was a live wire waiting to be connected with something, but he hadn't burned up anything when the Civil War came along and gave him his big chance. A day came when heavy reinforcements, troops, cavalry, artillery, munitions and supplies, had to be rushed southward through Cairo within two days. The Illinois Central was the only railroad leading to that city. The "needle's eye" was between Centralia and Cairo. Here was a single line that must bear the full brunt of the enormous traffic. The railroad faced the necessity of rushing these troops and supplies through, and at the same time maintaining a semblance of regular train service.

The hope of the government and of the Illinois Central centered that day upon Marvin Hughitt the youthful trainmaster at Centralia. Could he do it? This was the question uppermost in the minds of government and railway officials alike. No sooner had orders reached Centralia than young Hughitt unwilling to share the responsibility with anyone, sat down at the train dispatcher's table and started the trains rolling. For a day and two nights he sat there,

kept the trains moving faster than the government had dared hope for, and when he rose from the table after 36 nerve-racking hours at the key, every soldier, horse and gun, and every piece of equipment was safely in Cairo.

But barely had he left his instrument when a second order came to rush the troop and supply trains back through Centralia to a point farther east to meet another emergency. Again the 25 year-old trainmaster seated himself at the dispatcher's table and for another continuous stretch of 36 hours he kept the troop and munition trains on the move.

Long before those 72 hours had elapsed the name and fame of Marvin Hughitt had reached the ears of President Lincoln in the White House, Secretary Stanton in the war department and General Grant in Kentucky. He had performed an invaluable service. Not only had the troop and supply trains all been safely delivered on record time, but, what was more remarkable, the regular schedule of the Illinois Central had been maintained without interruption or delay!

This remarkable feat — performed at Centralia, Ill., 65 years ago—was the turning point in the career of Marvin Hughitt. The day, the deed to be done, the great emergency, always produce the man.

Friendly Enemies in Sports and Business, President W. W. Atterbury of the Pennsylvania Railroad, and P. E. Crowley, President of the New York Central Lines, Prepare to Hunt for Lost Balls. Wide World Photo.

The Rise of Arthur Thompson

Someone said, years ago, that the newspaper business was one of the finest imaginable for a young man because it was such an exceptionally excellent thing to get out of; meaning, of course, that a reporter meets many important persons whose friendship or good will is likely to turn something his way and help him along in the world.

Railroading, too, is a wonderful school for advancement for the chap whose eyes and ears are open. Malcontents and pessimists to the contrary notwithstanding, crepe-hangers and Gloomy Guses out of the question, the man smart enough and energetic enough to do something on a railroad to draw attention to himself can't be kept down, any more than he can be hidden in any other live business; and after he has started up the wellworn ladder of promotion it isn't long before some alert industrialist has both eyes on him.

More money and time have been spent by railroads in training good men for the captains of industry than the world may imagine. If you doubt it consult Who's Who in America or read the daily papers, and you'll get the surprise of your life. Reporters and editors are forever meeting men in the business world who were graduated from their own ranks, and they know, better than most persons, how many executives of great industrial enterprises came out of railroad offices. The two businesses run close together in this respect, all of which gives some support to the declaration, often heard, that all a man needs in this world is a little publicity. You may not stay up nights to love the boy on your block who beats a drum, but you can't deny that people know he's around. This is advertising, slightly objectionable, it is true, but effective, and as old Ed Howe once said, if you don't make a noise occasionally the world may not know you're on earth, no matter how smart you are.

There is much truth and sound common sense in the bromidic quotation, so often used about the gent who said all men are masters of their fate. "The fault, dear Brutus," said he, "is not in our stars, but in ourselves if we be underlings." To every man there comes a great day, a chance to beat a drum, not riotously enough to make people wish he were in Halifax, but loudly enough to let it be known he is about to put over a stunt of some kind proving his mettle, telling the multitude he is on the job where and when needed—the big moment.

Arthur Webster Thompson of Philadelphia, formerly first vice president of the Baltimore & Ohio, is an outstanding example of this railroad training for industry; not but what railroading itself is the liveliest kind of industry, should anyone show interest in the ques-

tion. Thompson's career upsets the dope in at least two particulars: He wasn't born on a farm and he failed to learn telegraphy. Despite these handicaps the boy could not be kept down. His parents weren't wealthy either so it became necessary for him to get an education and earn his living, and this he proceeded to do in a thoroughly American way. Blood does count in the battle of life. From his mother's side of the family he is a direct descendant of Colonial Websters — John Webster, one of the early governors of Connecticut, Noah Webster who put the country's language into book form, was a great-great grandfather or something. Arthur's father, Sheldon Thompson, who was some kind of an engineer helped to build the water services of the Lake Shore & Michigan Southern in Illinois, and then worked with the pioneering gentlemen who put the Santa Fe System through from the Missouri River to wherever it was headed at the time.

So Arthur saw his first real life in railroad camps, and what he encountered made him determine to be a builder, like his father. He was only 7 years old when the family moved east to Meadville, Pa., where his dad became foreman in the Erie shops. Meadville is also the home of Allegheny College, a point worth remembering because it had a lot to do with molding the boy's character. His mother, like many another with high-minded ambition for her son, talked college and Noah Webster to the boy until he grew to believe that to enter life unlettered and unprepared would be a crime.

It was at Meadville that Arthur began to develop the determination that grew stronger with the years to get an education even if he had to work his own way through the sacred halls of Allegheny College with manual labor. And this is precisely what, eventually, he had to do because the sixteen hundred dollars his mother had saved for his college years was lost when the home town bank failed to open one morning. "Don't worry, mother," said the boy, then about 17 years old, "don't you worry. I'm going to college all right."

And he did. He had his four years at Allegeheny, an institution founded in 1815, and therefore thoroughly hoary and extraordinarily revered. He gathered up kindling at an old saw mill, sold it for five cents a bundle in the little town, and put it away safely—not in a bank—until he had sixty dollars. Then he bought a little steamboat for $160, borrowing a hundred on his father's endorsement, a wheezy contraption with a four-horsepower engine that made more noise than the first so-called motor car you can think of, and with this he built up a ferrying business among fishermen tourists at Bemistown, five miles away. All through his college years he kept up his ferrying job, got some extra work with the borough engineer carrying a chain and looking for stakes with tacks in them, and then landed in the Erie shops as an apprentice at nine and three quarter cents an hour. He went out with engineers and gangs repairing county bridges so that tractors, new things in those days, could pass over them safely. He found work with the engineering corps laying out the new Pittsburgh, Bessemer & Lake Erie R. R., learned drafting, and stayed with the outfit until he had to quit in order to be graduated with his class. He was the busy boy.

Thompson left Meadville the day he was graduated, and went to Pittsburgh. He found no one waiting to employ him; picked up all kinds of dinky little jobs as draftsman at $40 a month, and at length found himself heading a surveying party on the Baltimore & Ohio, then in the process of reconstruction and a hundred million dollar program of expansion.

After a year's hard work he was still looking upward and far ahead, was called a promising lad, whatever that indicated, and then as happens so frequently, came the brighter day. The division engineer fell ill. These things are heaven-sent for writers of Little Stories. If the big boys never failed to show up there's no telling what would become of the understudies. It sounds like a movie scenario—if such things do make sounds—but it is the solemn truth. Not only did the division engineer fall ill but he had the forethought to do it just when there was a gap in the line that had to be finished; there was a flurry at headquarters —could Thompson do the work? "I'll say he can."

One of the big, gloomy-faced, high hat, brass collars hastened out to see about it. The work was going ahead with a new zip. Things were moving. Down with the old. Up with the new. The brass collar went back to headquarters and reported that if the story was to be worth a whoop this young chap must be promoted. So in about a year they made him division engineer, and no sooner had they done it than things began to happen. Emergencies arose! Thompson was two jumps ahead of them every time. Headquarters called up at six o'clock in the morning to inquire how the work was getting along on the five miles needed before freight could be put through and the road saved from everlasting bankruptcy, only to learn the work had been finished before breakfast.

So they moved him on to Pittsburgh. That was in 1901, and from that minute it was just one promotion after another — seven of them in eleven years! The record the man made in engineering was astounding in many ways, but spectacularly so where bridges were concerned. He could have a bridge torn down and another one put up without delaying a train, and never wilt a collar. Things came to such a pass that when the president of the Baltimore & Ohio heard a section of track had

been washed away or a wreck had mixed things up for further orders, he used to turn over, if the news came at night—as usually it did and does—and observe casually that if Thompson was there everything would be all right, and please don't slam the door going out.

And this was the man the United Gas Improvement Co., of Philadelphia snapped up just as quickly as possible—a billion dollar concern; and here he is, if you please, chairman of the board of the largest engineering and construction outfit in the United States, formed recently, with Dwight P. Robinson as president.

There's more to the story—columns more of it—and every bit of it filled to the brim with the romance of achievement, but the moral keeps bobbing up: Why do railroads spend so much money and time training brains for other great companies to take from them? But this, after all, is not a moral. It's a problem, and railroads have several of these on hand.

Young men contemplating a career in engineering ought to find encouragement in the remarkable success of Dwight P. Robinson of New York and Boston, elected recently to the presidency of the largest construction enterprise in this country, and probably the largest in the world, and of Arthur W. Thompson, chairman of the board, another accomplished engineer. Coming in a time when pessimistic persons are declaring the colleges are turning out too many engineers the stories of these two men serve a fine purpose, to emphasize the comforting reflection that good men simply can not be kept down.

Every railroad man on the American continent knows the name of Dwight P. Robinson as he knows the affairs of his own road for the reason that, year after year, the company which has borne his name for so long has become the synonym for good construction through the work its forces have done for steam transportation facilities in every part of the country.

Dwight P. Robinson has been engaged for 35 years in bringing large construction enterprises to completion with speed and economy. He was born in Boston, May 1, 1869, was graduated from Harvard in 1890, and two years later from the Massachusetts Institute of Technology, where he obtained his electrical engineering education. He became an assistant in the mechanical engineering laboratory at Mass. Tec. and in 1893 joined the forces of Stone & Webster. Within a few months he was placed in charge of that company's Chicago office. From 1895 until 1903 he was engaged in operating light and power properties under Stone & Webster management.

Mr. Robinson returned to Boston in 1903 in charge of all Stone & Webster engineering, and when the Stone & Webster Engineering Corporation was formed he was made president in charge of both engineering and construction activities. In 1912 he was admitted to partnership. From 1912 to 1918 he had charge of notable hydro-electric developments in Washington, California, Connecticut, Maine, Georgia and Montana, and the building of steam power stations at Seattle, Minneapolis, Boston, Houghton (Mich.), Savannah, Jacksonville, Tampa, Pensacola, Columbus, Dallas, Fort Worth, El Paso, Houston, Port Arthur, Pittsfield, New Bedford and Bridgewater, Mass.

With his organization of unusually capable and devoted men, Mr. Robinson, as the first president of the American International Shipbuilding Corporation, developed Hog Island. He resigned from this company in the spring of 1918 and in the fall of that year organized Dwight P. Robinson & Company, Inc., New York, to conduct an engineering and construction business.

The General and the Railroader

Gen. John J. Pershing was being introduced to his reception committee at the Union station when suddenly his gaze traveled beyond the circle of dressed-up folk, and lit on a suit of striped overalls. Then the call of old days was answered.

The guest of honor broke through the reception committee line and pumped away on the arm of a man who appeared to be a railroader.

"Old Jessee!"

"Old John!"

"You old son-of-a-gun!"

"I'll be doggoned!"

The official committee, very dignified in their top hats and morning coats, were forgotten.

The other half of the reunion was D. C. Jessee, an assistant foreman for the Kansas City Terminal Railway Co., and the pair had not seen each other since they were school teachers together years ago in a Missouri country town.

A Railroad Ticket

By Howard Elliott

A railroad sells transportation, but it sells something else along with it. It sells SERVICE. The price of a railroad ticket covers both.

Transportation means the same thing on all railroads. Service may mean a very different thing on one railroad from what it does on another.

Railroad service begins at the ticket office when the railroad patron buys his ticket. It ends at the station where he alights. Between these two points should stretch the railroad smile. It helps business.

First impressions count for much in life. That is why a smile at the ticket office window and a display of affability, courtesy and willingness to answer questions and give information on the part of the agent is essential to good railroad "service." It creates in the mind of the railroad patron a pleasant picture of the railroad.

Ocean Vessels to Stockton in 1928

A Dream for 50 Years

By C. W. Geiger

The Ship Channel in the Heart of Stockton. The New Channel is to Connect With the Facilities Shown in This Picture.

OCEAN vessels will be running up to Stockton before the end of the year. The present ship channel is to be improved to give a minimum depth of 26 feet and a width sufficient for anything afloat in double column if necessary. The money is assured. The dream of 50 years is about to come true.

By a vote of twelve to one the people of Stockton have provided $3,000,000 for this project. The state is granting $419,000 and the federal government, $2,407,500. Field surveys have been completed, and actual dredging will begin soon. Coastwise vessels are expected to use the improved channel within six or eight months after work begins. Terminal facilities at Stockton to handle a million tons of freight a year will be completed by 1932. Terminal improvements between the present head of navigation in Stockton and the San Joaquin River will include 800 linear feet of transit sheds, a total of 1,200 feet of wharves and adequate turning and passing basins.

Beginning in Suisun Bay on the West, the new channel will extend through New York Slough and then along the present course of the San Joaquin River to a point inside of San Joaquin county, where the first real cut will be made across a point on Mandeville Island. Another cut will follow on Venice Island. East of Venice Island the deep water channel will follow the San Joaquin River in the main, points being cut off here and there; bends will be straightened and the channel widened and deepened in places.

The principal part of the work in the river is called for between Black Slough and the mouth of Stockton Channel. This channel will be deepened up to about Van Buren street, the harbor development taking place west of this point. The channel will have a minimum bottom width of 100 feet. The levees will be set back 230 feet from the center line of the stream, and the right of way will be 750 feet wide. The moving of more than 21,000,000 cubic yards of material will be necessary. The federal government will maintain the ship channel after it is completed.

Of Stockton's $3,000,000 share $1,307,500 will be spent for dredging, for levees and the remaining rights of way, spoilage disposal areas and terminal facilities. Large acreages have already been reserved by the city for deep water purposes. Of the federal appropriation of $2,407,500, $1,307,500 will be used for dredging and levees. The remainder will be used for dredges, if necessary.

Plans to create a deep water port at Stockton are not based on sentiment or theory, but on the fundamental fact that transportation by ocean-going vessels will eliminate costly hauls on thousands of tons of merchandise, farm products and materials moving between points of the world and the Sacramento-San Joaquin Valley and Northern Nevada. In addition, it will stimulate new industries and commerce which otherwise would not be practicable.

Scores of California communities will be benefited, and not one will be negatively influenced while the improved facility will promote new trade between central California and all of the Pacific nations.

When the volumes and varieties of commodities now exchanged by central California with Pacific and other nations are understood, a great romance of commerce on

Ship Yards of the California Transportation Company in Stockton, and Two of the Recent Modern River Steamers Constructed at Those Yards. Somehow a Reminder of Early Days on the Mississippi.

which the Stockton Ship Channel will raise the curtain is to begin. Today, Stockton and other communities throughout the Sacramento-San Joaquin Valley are sending dried and canned fruits throughout the world, and many markets are eager for fresh fruits that are abundant there. To China, leather is shipped from Stockton; to Japan, boxboard; to Australia, paving plants; to Mexico, centrifugal pumps; to Europe, grain, pencil slats and other commodities; to South America and China, condensed milk and other foods; to South America, Africa and Australia, agricultural machinery, and so on.

From many parts of the world central California brings food stuffs, hides, iron, steel, coke, wood pulp, chemicals and many other articles.

The existing waterways that have been or will be used for navigation are under the supervision of the United States war department, being included in what is officially termed the second San Francisco district. The principal waterways on which Stockton commerce now is borne are the San Joaquin River, and Stockton and Mormon Channels, these connecting with Suisun Bay and in turn San Francisco Bay, Golden Gate Strait and the Pacific Ocean. Stockton is about 100 miles distant by water from the Golden Gate. Stockton Channel penetrates the heart of Stockton and connects the city with the San Joaquin River west of Stockton, the channel being 2.5 miles long from west to east, and having as a branch south Mormon Channel which is navigable and affords water frontage for 1.7 miles, and as a branch to the north Fremont Channel which connects with McLeod Lake, this short channel and the lake serving as harbors for small craft.

From the mouth of Stockton Channel the San Joaquin River extends 42.5 miles to Suisun Bay. Tidal influence is observed over the lower 65 miles of the river which decreases in width from 4,000 feet at its mouth to 200 feet at the mouth of Stockton Channel. Both the channel and river between Stockton and the bay have minimum depths of nine feet.

Cotton and Freight Rates

That cotton distribution is not restricted by the cost of transportation is shown by a study just completed by the bureau of railway economics in respect to cotton production and distribution and the effect of freight rates on prices received by the grower.

"During the period from 1910-1915," says the bulletin, "the annual difference between the price of cotton at Liverpool and on the farms of the United States was $2.72 a hundred pounds. In the period 1916-1920 the average was $12.04, while in the period 1921-1926, it was $5.32.

"The differences between the Liverpool prices and the United States farm prices presumably cover all costs of transportation by rail and water and such other costs of handling as commissions, insurance and profits, if any.

"Export rail rates on cotton in the United States represent a comparatively small part of these differences. The export rates, which include terminal expenses in getting shipments to shipside, averaged between 75 and 85 cents a hundred pounds during the four crop years, 1923-1926, which was from 14 to 16 per cent of the cost of taking the cotton from the American farmer to Liverpool.

"Compared with the delivered prices, the cost of rail transportation of cotton in the United States averaged but 3 per cent of the Liverpool price."

10-Cent Fare in 214 Cities of America

An article in Aera, the American Electric Railway Association's official magazine, states that a ten-cent basic fare has been granted by 214 of the 313 cities of 25,000 or more population having street car service, with modifications to meet local conditions.

If thou wouldst lay hold on life, save time, for time is the stuff that life is made of.—Franklin.

Over 170,000,000 lbs. of paper, lead and copper are used yearly in one plant alone to produce telephone cable required for the Bell Telephone System.

When A Gob Comes Aboard After Liberty Ashore A Marine Searches Him At the Gangway, Tells Him to Get Into His Hammock or Leads Him to the Brig, According to Whether He's C & S or D & D. Consequently Gobs Put in no Time Cheering the Marines. And Here's A Gob Sitting Between Two of the Tribe on a Fairmont Motor Doing Police Duty Down in Nicaragua. The Railroad Has 22 Such Cars.

Fairmont Motors in Nicaragua

The United States marines shown in the illustration with this item are leaving Puerto Cabezas, Nicaragua, on a Fairmont motor car for police duty up the line. The poncho worn by the privates suggests the questionable pleasure of doing guard duty in a tropical rain.

The fleet of 22 Fairmonts owned by this road includes cars used for inspection, section work and extra gangs. Service has been so satisfactory that one of the marines wrote to the factory in this country commenting on the fact.

On Time Performance

No matter how much spare time people may have before or after a railroad trip they always seem to begrudge every minute spent on board the train.

"Are we on time?" is the question passengers most frequently ask. And in case there is a delay of even a few minutes there is much consulting of watches and discussion of whether the lost time can be made up.

Nobody who has not had experience in railroad operation can have an adequate idea of the things that can come up to interfere with and delay the movement of trains.

A bolt on the locomotive may work loose. Dirt may get into the air brake of a coach or Pullman. A hot box may develop if the journals are not properly packed. Unexpectedly large amounts of mail and express may have to be loaded or unloaded. Work on the track may slow down train movement. Peripatetic cows and hogs may dispute the right of way with the train, with disastrous results to themselves, and have to be removed. Heavy rains may cause washouts and severe storms may make it necessary to cut down speed.

These are only a few of the most obvious things that may delay trains and that, with hundreds of others, are likely to happen even on the short runs of local trains. When through trains are operated over long distances, as from New York to Tampa or Key West, these difficulties are greatly multiplied.

For these reasons the on time performance of the Atlantic Coast Line in recent months is all the more striking.

For the six months ended Septemper 30, 1927, 97.7 per cent of all Coast Line passenger trains maintained their schedules.

The poorest showing was made in April when 96 per cent of the trains covered their runs in schedule time. In July the percentage of trains maintaining their schedule was 98.6 per cent.

In June and July schedules were maintained by more than 99 per cent of the trains on four districts.

These figures, be it remembered, apply to the through trains from New York to Florida as well as the local and branch line trains, and involve more than 200 trains a day.

During the 260 days from Feb. 27 to Oct. 23, Number 75, the Havana Special, through, deluxe flyer from New York to Key West, was late only five times, an on-time performance of 98.1 per cent.

W. M. Jeffers, general manager of the Union Pacific Railroad, reports that out of 3,623 fruit trains and 52 silk trains handled by his road during 1927 only one arrived at the Council Bluffs terminal behind schedule. This increase in fruit trains hauled during the year was more than 400, and this meant as high as 1,249 refrigerator cars a day at Council Bluffs, a new high record.

Now the French are objecting to locomotive whistles. According to recent reports, life at Levallois Perret, a suburb of Paris, is just one whistle after another, and the inhabitants protest they haven't had a peaceful night's sleep in ten years.

Three thousand locomotives pass under the signal bridges in the suburb every 24 hours, in and out of Paris. The inhabitants estimated that each locomotive whistled at least five times on every visit, making 15,000 screeches a day. And something is going to be done about it, but no one knows just what.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

THE dream, several years long, of unifying the $59,000,000 of railroad properties operated by the five separate interests in the harbor districts of Los Angeles became a reality February 1, through a ceremony held in the room that is to be the mayor's office in the new city hall. It is the first official action of the city government in the new building.

President Allen of the harbor commission signed the unification contract for the city, President Carl Gray of the Union Pacific system signed for his people. Vice President G. L. King signed for the Southern Pacific and Vice President D. W. Pontius for the Pacific Electric Railway Co. General Manager W. K. Etter of the Santa Fe was present to pledge the signature of President W. B. Storey of that line. Burt A. Heinly, secretary of the Greater Harbor Committee of Two Hundred, is to take the document to Chicago for the lacking signature.

President Gray said, "This is as unique a proposition as has taken place in such circles anywhere in the country. On the part of the railroads it is a surrender of years of intrenched advantages for themselves in favor of the general public interest. It is a step in a new direction. The attitude of the Greater Harbor Committee of Two Hundred has been remarkably helpful in this action."

A board of control is to have supervision over the combined railroad properties of the city and the four railroads, and they are to be operated as a unit by a board of operation under the control board. On the control board will be four representatives of the city and one each for the four railroads. On the operating board will be one representative each of the city, Union Pacific, Southern Pacific, Pacific Electric and Santa Fe.

The unification has been declared by many in public life to be the greatest step in harbor progress since the building of the breakwater sixteen years ago, which virtually made the harbor.

Fruit and Vegetable Shippers in Convention

A thousand or more members of the Western Fruit Jobbers Association of America are holding their annual convention in Los Angeles this week, at the Hotel Biltmore. Many railroad executives and traffic men are here from every part of the nation. Members began to arrive Sunday, January 29 although the convention proper was not scheduled to open for business until Wednesday, February 1. Registration began Monday morning at the Biltmore, but visitors have spent their time in nearby sea-beach resorts and in the mountains. Special trains which began to arrive Tuesday over the several railroads stopped for the day at Riverside where orange packing plants were inspected.

J. J. Bernet, President of the Erie, Attends the Fruit Jobbers Annual Convention in Los Angeles.

Among the railroad executives in the city or those for whom reservations had been made were J. J. Bernet of the Erie, J. E. Gorman of the Rock Island, William Sproule of the Southern Pacific, W. B. Storey of the Santa Fe, Carl Gray of the Union Pacific, Harry Adams of the Western Pacific, and others.

Still, Freight Rates Should Be Reduced

A petition by western railroads to set aside an award increasing the pay of locomotive firemen and hostlers on 55 systems, was dimissed February 1 by Judge George A. Carpenter, in federal district court at Chicago.

The effect of the dismissal is to make the increase effective unless the roads take an appeal to the United States circuit court. They have ten days in which to ask a review by the higher court.

The western systems challenged the wage award of a board of arbitration on the grounds that it was made after the board previously had advised the federal court it could not agree. Later, four members signed the award, two others, representing the railroads, declining to participate. Chief Justice Burke of the Colorado supreme court, was chairman of the arbitration board.

The award provides an increase of 30 cents a day for passenger firemen and 35 cents a day for all other members of the Brotherhood of Locomotive Firemen and Enginemen of western roads. Approximately 55,000 employes are affected and the award, if it becomes effective, will add $4,000,000 annually to pay rolls of the roads involved.

S. P. Makes Safety Record

Completing its eighth consecutive year without a fatality to passengers in steam train accidents, the Southern Pacific established a new record for prevention of accidents to passengers and employes during 1927. During this eight year period the railroad safely transported 336,973,499 revenue passengers 12,894,460,154 miles. In 1927 for each fatality and reportable injury to employes in train service a train was run a distance equivalent to 3.7 times around the world. Casualties to employes in train and train service accidents in 1927, including casualties to employes in all branches of the service occurring in such accident, were 9.21 per million locomotive miles. During the past year industrial casualties per million man-hours, including employes on the track and in the shops and freight houses, were 9.72, a reduction of 17.3 per cent compared with 1926 which was the best previous record. Break-in-twos per million car-miles in 1927 were 1.29, a reduction of 24.5 per cent compared with 1926 and 80 per cent compared with 1919.

Railroads Have Power in Reserve

During the past four years the railways have handled a large freight traffic with at all times a reserve fund of motive power and of freight cars. In fact, the traffic of these four years, it is shown by figures just made available, has been greater than in any other four years of railway history, and the amount

of equipment in reserve has also been greater than ever before. In other words, this reserve motive power constituted a guarantee on the part of the railroads that the transportation needs of the public were being adequately protected.

While the traffic in 1927 was 2.6 per cent less than in 1926, the reserve or surplus of motive power and of freight car capacity increased by a much greater margin than would be explained by the smaller traffic, according to Dr. Julius H. Parmelee, director, bureau of railway economics.

"The number of stored locomotives in 1927," Dr. Parmelee points out, "ranged from a minimum of 4,600 on January 15, to a maximum of 6,663 on August 1. Both this minimum and this maximum were higher than the corresponding extremes of 1926, which were 3,841 and 5,978, respectively.

"While these statistics of minimum and maximum are significant, they do not tell the story of the potential reserve of motive power for the haulage of freight and passengers so fully as the averages of the respective periods. On this basis, too, the year 1927 stands out above 1926 and the five years ending with 1926.

"The average number of stored locomotives in 1927 (eleven months) was 5,788 compared with 5,123 during the year 1926, and an average of 4,523 for the five-year period. This large number of locomotives in storage during 1927 was 13 per cent above the average for 1926."

Great Northern Tunnel to Be Ready Nov. 30

The new seven-and-three-quarters-mile Cascade tunnel on the Great Northern, between Scenic and Berne, Wash., the longest tunnel in the western hemisphere and the fifth longest in the world, will be completed November 30, 1928, as originally scheduled, according to announcement by the contractors.

The announcement was made in connection with a report of work on the tunnel for the year December 1, 1926, to December 1, 1927. Progress for the year, according to this report, consisted of driving through 14,000 feet of pioneer drift, 16,500 feet center heading drift, 21,100 feet of full tunnel and 13,000 feet of concrete lining, leaving the work yet to be done, consisting of 4800 feet of pioneer drift and 16,981 feet of enlargement.

"In other words," the report stated, "the preparatory drift driving is 90 per cent complete and the main tunnel 60 per cent complete. The pioneer drifts are expected to meet about April 1, 1928, thus establishing a record for driving through seven and three-quarters miles of the Cascade range in 28 months."

This tunnel, when completed, will eliminate 11 miles of covered track when the line now runs through tunnels or snow beds.

The importance of the new tunnel will be appreciated when it is known that in 1927 storms cost the Great Northern approximately $300,000, and contributed largely in lowering the December net operating income of the road, according to Ralph Budd, president. Gross revenues approximated the $8,111,043 of the same month in 1926, Mr. Budd declared. Weather conditions retarding the movement of grain and other freight on the road have tended to affect earnings.

Frisco Lines Reduce Accidents

The Frisco Lines achieved, in 1927, the greatest reduction in accidents to passengers, employes and at grade crossings of any year in their history, the result of a consistent campaign conducted by the railroad among its 30,000 employes and nearly 100,000 school children in the nine-state territory served by the road. Casualty decreases, as compared with 1926, were as follows: Passengers, 30 per cent; autoists at grade crossings, 12 per cent; mechanical shop employes, 18 per cent; maintenance of way and structures employes, 9 per cent; transportation employes, comprised of engineers, firemen and trainmen, 8 per cent. The only increase in casualties was among licensees and trespassers, over which the railroad has no direct control, and even here the increase was slight. The Frisco Lines conducted 513 accident prevention meetings in 1927, attended by 53,278 persons, and in addition 95,000 school children were addressed in schools by accident prevention agents.

I. C. C. Disapproves P. & L. E. Labor Contracts

Following an investigation of the practice of the Pittsburgh & Lake Erie in paying labor contractors for their services in connection with the employment of maintenance of way laborers and allowance of 10 per cent of the monthly earnings of its track and roadway laborers including supervisory and commissary employes, Interstate Commerce Commission has held that this practice cannot be regarded as consistent with efficient and economic management. An investigation covered the period from March 1, 1920, to June 30, 1925, and the commission held that the payments of the 10 per cent of the monthly earnings of track and roadway laborers resulted in greater expenditures than would have been necessary had the road handled the work with its own organization or had the usual fees allowed labor agents for similar work been paid. Whatever may have been the justification for such an arrangement in the beginning, under conditions which then existed the commission declared that the facts of record do not justify its continuance.

Electric Lines Have Good Safety Record

Only one passenger out of every 155,000,000 carried by American electric railways was fatally injured last year, the American Electric Railway Association and the American Museum of Safety said.

The statement was made in connection with announcement that the Louisville Railway Company, the El Paso Electric Company and the Tidewater Power Company of Wilmington, N. C., have been awarded Anthony N. Brady Memorial medals for outstanding accident prevention and health-promotion records. The Pittsburgh Railways Company received honorable mention.

The Porter Nomination Is Confirmed

The nomination of Claude R. Porter of Iowa to be a member of the Interstate Commerce Commission, succeeding Commissioner Hall, who resigned, has been confirmed by the senate.

I. C. C. Won't Suspend New Tariff

The Interstate Commerce Commission has declined to suspend the operation of tariffs filed by New York Central, Boston & Albany and Lehigh Valley railroads providing for the movement of merchandise in container cars. The new tariffs have become effective.

Operation of the tariffs was opposed by Pennsylvania, Baltimore & Ohio and other roads.

The Seaboard Gets a Short Line

The Interstate Commerce Commission has authorized the Seaboard Air Line to acquire control of the Naples, Seaboard & Gulf Ry. by purchase of its capital stock. Permission was given the Seaboard to issue $1,184,000 first and consolidated mortgage 6 per cent gold bonds and to pledge them as collateral security for short term notes. The Naples line was given permission to issue $1,719,000 first mortgage 25-year 6 per cent gold bonds which are to be sold to the Seaboard at par.

The Interstate Commerce Commission has authorized the Western, New York & Pennsylvania to abandon that portion of its Wolf Creek branch extending from Carmona to Redmond, Pa., a distance of

8 miles. The commission refused to permit the road to abandon that portion of the branch extending from mine No. 5 and Carmona, a distance of three miles.

An Interstate Commerce Commission examiner has recommended in a tentative report that the commission permit the Northern Pacific to abandon about 16 miles of line in Sanders County, Mont.

Interstate Commerce Commission Examiner Sullivan has recommended that the commission deny the application of the Southern Railway for authority to construct a 1¼-mile extension of its line from a point on the tracks of the Lehigh Portland Cement Co., to the plant of the Vulcan Rivet Corp. at Tarrant City, Ala.

Motor Transport Elects Officers

The newly authorized motor transport division of the American Railway Association perfected its organization at its first meeting held in Chicago, January 25 at the Palmer House, with the election of officers and a general committee to serve until October, 1929. The meeting was attended by 90 delegates representing more than 70 of the principal railroads in the United States and Canada.

The object of the motor transport division is to establish a clearing house for transportation thought and development of motor transportation by railroads, and for studying the problem raised by highway competition in order to determine the facts and fundamental principles involved. To accomplish this purpose, studies and reports of the division shall be made on such territory, with its specific problems and its methods for meeting them, as the needs or desires of the member roads shall indicate.

The motor transport division is organized in three sections dealing, respectively, with the study of the application of the motor coach, the motor truck and the rail motor car to the use of steam railroads. The importance of this general field and its international interest was evidenced by the statement made in the meeting that delegations from England, Japan, Australia and Germany have already visited this country to investigate American railroad activity in the field of motor transportation, while inquiries have been received from railways in Chile, Switzerland, Sweden, Japan, Cuba, Australia and England regarding the motor transport problems confronting the American lines and the methods by which these problems are being met. The following officers were elected:

Chairman, A. P. Russell, vice president, New York, New Haven & Hartford.

Vice chairman, motor coach section, T. B. Wilson, vice president and manager, Southern Pacific Motor Transport Co.

Vice chairman, motor truck section, G. C. Woodruff, assistant freight traffic manager, New York Central.

Secretary, G. M. Campbell, assistant to secretary, American Railway Association.

The office of vice chairman in charge of the rail motor car section was not filled.

In addition to the foregoing officers, the organization includes a general committee which will exercise supervision over the interests and affairs of the motor transport division. The chairman and the vice chairmen are ex-officio members of this general committee, and the following other members were elected:

J. G. Drew, vice president, Missouri Pacific.

H. F. Fritch, passenger traffic manager, Boston & Maine.

A. Hatton, general superintendent of transportation, Canadian Pacific.

C. S. Lake, special assistant to president, Chesapeake & Ohio.

G. W. Lupton, assistant to vice president, Atchison, Topeka & Santa Fe.

R. K. Stackhouse, general superintendent stations, transfers and motor service, Pennsylvania R. R.

R. N. Van Doren, vice president and general counsel, Chicago & North Western.

The next meeting of the motor transport division will be held at Atlantic City, June 21 and 22.

North Shore Line Freight Increase

With the tonnage for December estimated, the freight and merchandise dispatch traffic over the Chicago, North Shore & Milwaukee totaled about 825,000 tons in 1927 or an increase of 170,000 tons over 1926. This gain is due to the freight facilities afforded by the new Skokie Valley route, which has convenient connections with steam railroads for the interchange of cars.

Prior to the opening of the Skokie Valley route in 1926, the North Shore Line was unable to hand'e carload freight south of Highland Park because of franchise restrictions in the various municipalities through which it operates. The new high-speed double-track line, however, is constructed on privately owned right-of-way for its entire length. Since the opening of this route, 15 large concerns dealing in coal, lumber and

HUTCHINSON TRAIN INDICATORS

NEW MODEL SHOWING MAKE UP OF TRAINS

Railways Using Hutchinson Indicators

C. & A.
C. M. & St. P.
Penna.
C. B. & Q.
C. & N. W.
N. Y., N. H. & H.
B. & O.
C. P. R.
Can. Nat'l.
Mich. Cent.
Cent. of N. J.
Long Island
K. C. Southern
C. R. I. & P.
Santa Fe
Mo. Pac.
Ill. Cent.
Erie
D. L. & W.
Big 4
Monon
A. C. L.
Southern
Seaboard
Grand Trunk
Florida East Coast

Hutchinson—
the originator of Train Indicators, makes any type and size for any condition.

J. HUTCHINSON
80 Station Road
Great Neck, N. Y.

building materials have located their yards adjacent to its tracks and building operations have flourished.

Available Car Supply

Class I railroads had 424,291 surplus freight cars in good repair and immediately available for service January 15, the car service division of the American Railway Association announces. This was a decrease of 37,378 cars compared with January 7 when there were 461,669 cars.

Surplus coal cars totaled 161,487 on January 15, a decrease of 15,679 cars within approximately a week while surplus box cars totaled 207,980, a decrease of 21,382 for the same period. Reports also showed 23,657 surplus stock cars, a decrease of 875 under the number reported January 7 while surplus refrigerator cars totaled 14,576, an increase of 315 for the same period.

Loadings Decrease Under Year Ago

Loading of revenue freight for the week ended January 14 totaled 906,734 cars, according to reports filed by the car service division of the American Railway Association. This was an increase of 152,672 cars above the preceding week, which included the New Year holiday, with increases being reported in the total loading of all commodities.

The total for the week of January 14 was, however, a decrease of 35,997 cars under the same week in 1927 while it also was a decrease of 25,001 cars compared with the same week two years ago.

Miscellaneous freight loading for the week totaled 314,635 cars, an increase of 659 cars over the same week last year but 5,444 cars below the same week in 1926.

Coal loading amounted to 191,224 cars, a decrease of 37,216 cars under the same week in 1927 and 1,301 cars below the same period two years ago.

Grain and grain products loading totaled 48,633 cars, an increase of 4,650 cars above the same week last year but 611 cars under the same period in 1926. In the western districts alone, grain and grain products loading totaled 34,512 cars, an increase of 6,809 cars over the same week in 1927.

Live stock loading amounted to 32,386 cars, a decrease of 622 cars under the same week last year and 2,183 cars under the same week in 1926. In the western districts alone, live stock loading totaled 24,830 cars, a decrease of 630 compared with the same week in 1927.

Loading of merchandise and less than carload lot freight totaled 239,940 cars, an increase of 2,122 cars above the same week in 1927 but 1,983 cars under the corresponding week two years ago.

Forest products loading totaled 59,839 cars, 5,181 cars below the same week last year and 6,062 cars under the same week in 1926.

Ore loading totaled 9,008 cars, 454 cars above the same week last year but 751 cars below the same week two years ago.

Coke loading amounted to 11,069 cars, 863 cars under the same week in 1927 and 6,666 cars below the corresponding week in 1926.

All districts reported decreases in the total loading of all commodities compared with the corresponding week in 1927 except the northwestern, while all except the southern district reported decreases compared with the same period in 1926.

464,000 Trucks Built in 1927

Reports show that for the third successive year truck production was in excess of 450,000, reaching an estimated total for 1927 of 464,000. This record of success in the manufacturing field means similar success in the operating field, since no other explanation can be provided for the adding of so many pieces of equipment to the 2,700,000 in use on January 1, 1927.

Studies made public during the past year indicate that the 2,700,000 trucks in service on January 1, 1927, were owned by more than 2,000,000 individuals and corporations, revealing clearly how widely scattered truck ownership is. Statistics for fleet operation show slightly less than 1,000,000 trucks owned by 270,000 individuals and corporations, averaging less than four trucks to a fleet.

The ten leading uses of motor trucks, with the number of trucks used in each field, as indicated by a study of 1,300,000 trucks, are as follows:

R. F. D., owners	248,296
Groceries, food products	147,810
General contractors	83,853
Auto accessories	78,262
General trucking	70,735
Oils and gasoline	55,428
Lumber and logging	50,976
General merchandise	49,465
Meats and packing	40,074
Bakeries	40,058

Bus registration has reached a total of about 90,000 units in operation on January 1, 1928, as compared with 80,000 a year ago. Bus use is generally classified in terms of ownership, into three groups—independents, street railways and steam railroads. There have been many developments during the past year in all three fields including appreciable growth in the number of buses in service used by each type of operator.

The independent group remains preponderant in numbers. Furthermore many of the old and well established lines appear to have built up a large measure of financial stability. As has been the case since buses first came into use, many more independent lines have been started during the past year and have been dropped for lack of public support.

More important, however, have been the numerous consolidations of small companies into large systems. The bus business on the Pacific Coast, which developed five to ten years earlier than that in the middle west, east and south, set a precedent in the matter of consolidations which seems likely to be followed elsewhere. Chief among the important consolidations during the past year was the formation of the Motor Transit Corpn., a $10,000,000 holding company, which now controls four intercity lines operating over 15,000 miles of highway in five states in the middle west.

Bus Companies Organize in New England

The New England Motor Bus Association has been formed by electric railways and steam railroads, affiliating with the American Automobile Association. The purpose is to cooperate and give the public information about motor coach service, keep in touch with legislation, and work with New England's regulatory authorities.

Here Goes the Last Independent

The Northern Ohio Power & Light Co., has bought the Zeno Transportation Co., said to be the last independent bus company in Akron, Ohio. The Northern assumed control Jan. 9.

Cooperation In Oklahoma

The Oklahoma Railway, Oklahoma City, Okla., has submitted a proposal to state bus operators for issuance of through tickets on combined interurban, electric and independent bus lines.

Permit Denied in Virginia

The application of the Sandston Railway for authority to operate bus service between Richmond and Seven Pines, Va., via Williamsburgh Road, has been dismissed by the Viriginia corporation commission "without prejudice" by request of the petitioner. Opposition was voiced by the Virginia Electric & Power Co. and the Peninsula Transit Corpn.

Port Arthur Traction Sold

The Port Arthur Traction Co., Port Arthur, Tex., was bought at auction by the Eastern Texas Electric Co. for $150,000. The sale was ordered by the United States district court to satisfy

THE SOUTHERN SR SERVES THE S

SAVE $52,000 ANNUALLY

Read the following quotation from a letter written by the General Freight Agent of the Southern Railway Company. These paragraphs explain how a $35,000 investment in the Mercury Trackless Train System was written off in eleven months through reduced L. C. L. handling costs:

> "Since the receipt of your letter, as well as prior thereto, I have made some calculations as to what it would cost my Company at this station to abandon the Trackless Train Method, and to be entirely conservative in this estimate, the increased cost occasioned by the return to hand truck method would cost from $75.00 to $100.00 per day, and in some instances more, depending, of course, upon the amount of traffic handled."

The significance to you is that every road—yours—faces, with but slight variation identical possibilities for improvement and profit.

For over fifteen years, through constant contact with terminal problems, we have accumulated a fund of information invaluable to officials recognizing the chance of lowering their costs.

We will be glad to furnish you with a comparative estimate of costs and savings, based on a survey of any terminal of your road, and to verify this estimate with a practical demonstration if you so desire. A note from your secretary will place our entire engineering resources at your service.

MERCURY MANUFACTURING CO.
4120 South Halsted St. Chicago, Ill.

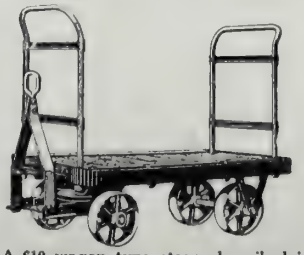
MercurY

Trackless Train

Mercury Type—R Gasoline Tractor Passed by National Bureau of Fire Underwriters, Decribed in Bul'etin 110.

A-310—all purpose castor steer trailer. Fully described in Bulletin A-100.

A-310—with corrugated box body. Described in Bulletin A-100.



A-610 wagon type steer, described in Bulletin A-125.

creditors holding $324,000 in mortgage notes. The creditors petitioned for the sale through the Dayton Trust & Savings Co., Dayton, Ohio.

J. G. Holtzclaw, general manager of the Eastern Texas Electric Co. says his company will replace the rolling stock on the Port Arthur lines with new cars and replace much old trackage with new rails. The Eastern Texas Electric Co. operates the railway of Beaumont and the Beaumont-Port Arthur interurban line.

Northern Indiana Foreclosure

Foreclosure proceedings against the Chicago, South Bend & Northern Indiana Ry. were filed on Jan. 8 in the United States district court at South Bend by the Central Trust Co., New York. The foreclosure action was brought by the Central Trust Co. as trustee for mortgages aggregating $3,000,000, issued to secure the railway's bonds. The company operates electric interurban lines connecting South Bend, Elkhart and Goshen, South Bend, La Porte and Michigan City, and South Bend, Niles and St. Joseph, Mich., in addition to city service in South Bend and Elkhart and co-ordinated bus service over certain parts of the system.

The line has been in the hands of Raymond R. Smith, former vice-president and general manager, as receiver since last fall.

Bus Service to Harrisburg, Texas

Express bus service to Harrisburg from Houston, Texas, has been established by the Houston Electric Co. The downtown terminus of the Harrisburg line, San Jacinto and Preston. The tentative arrangement calls for five to seven-minute service during the rush and ten to eleven-minute service for the off hours. The Harrisburg railway line from 67th street to the present terminus near Brays Bayou will be retained for several weeks. It is planned to remove the tracks from 67th street to the terminus when the bus service is perfected.

U. S. Freight Co. Expanding Its Service

The United States Freight Co. has begun operation of container cars from New York Central and Lehigh Valley railroads to cover territory from New York City to Boston and as far west as Cleveland. A similar agreement has been concluded with the Pennsylvania Railroad which, from present indications, will not begin until May 1. It will take about 90 days, says E. C. Strohm, president of the company, for the Pennsylvania to complete arrangements, such as preparing buildings in Jersey City, Baltimore and Philadelphia, as well as other cities, before the service can be instituted on this line.

This service represents an innovation in shipping methods, never before employed, whereby shippers of small, or less-than-carload, lots of merchandise will save from 4 per cent to 10 per cent of their gross freight payments. Monday's start provides for 58 distinct services in the eastern zone—for example, New York to Buffalo being one; New York to Boston a second, etc. It not only effects a saving in freight charges, but gives carload service on less-than-carload shipments.

The company will accept all commodities, regardless of classification. Heretofore, it has been restricted to the handling of shipments provided with carload ratings of third class or lower.

Street Car Guessing Contest

To arouse greater interest in street car service and as a stimulus to traffic the Gary Railways, Gary, Ind., recently announced a prize contest in which cash awards aggregating $100 would be made to the 15 answers which most nearly approximate the exact number of passengers carried during the 30 days ended February 12 by a single designated street car operated in the city. One of the company's new 52-passenger one-man, double-truck safety cars has been appropriately decorated for the contest, the sides and front and rear dashes of the car being painted white and labeled with the terms of the contest in bold letters. The car will be operated during the contest period.

Special Course for Executives

A six weeks' summer course in public utility management and economics for business executives will be given from July 9 to Aug. 18 by the Harvard University Graduate School of Business Administration, Soldiers Field, Boston, Mass., under Philip Cabot, professor of public utility management, and D. W. Malott, instructor in this subject. The course will cover various legal, economic, engineering and financial phases of management and will include a study of court and commission decisions covering valuation, depreciation and fair return, besides cases from company practice in methods of marketing rate-making, operation, finance, customer relations and the broad economic problems of production. The course will require the full time of the student, classes meeting for four hours daily. The case method will be followed throughout.

Injunction is Denied to Railroads

The application of 415 railroads in the federal court at San Francisco for an injunction to restrain the Interstate Commerce Commission from reducing transcontinental freight rates was denied January 18. The court sweeps away every contention of the railroads in a memorandum decision handed down following a hearing before a specially constituted court a month ago. The argument was before Circuit Judge Frank H. Rudkin and District Judges Frank H. Kerrigan and A. F. St. Sure. Judge St. Sure wrote the opinion.

The Interstate Commerce Commission, after a special hearing in San Francisco last October, reduced rates on deciduous fruit from $1.73 to $1.60 for all points east of Denver, and from $1.62 to $1.50 for all points west of Denver. The rates considered are on a hundredweight basis.

The railroads combined to fight the commission's order, contending that under the new rates, fruits would be carried at a loss; that the carrier was entitled to a "fair rate" independently of any other consideration, and that the commission acted in the fruit case without giving consideration to the entire rate structure of the country, which the carriers insisted was contrary to the spirit of the Hoke-Smith resolution. The decision says the railroads have not proved that a loss would be incurred under the reduced rates. The reduced rates in question went into effect December 15.

Great Northern to Build in Montana

Construction of a 75-mile line through parts of Phillips and Blaine counties in Montana will be started by the Great Northern Ry. as soon as the project is given federal approval. The road will extend northwestward from Saco, Mont., terminating about 12 miles west of Turner. It will involve an expenditure of $2,000,000.

State Values the Pacific Electric

California state engineers have placed a valuation of $88,103,479 on the Pacific Electric Railway system, according to a report made public January 27 at a hearing in Los Angeles before President Leon O. Whitsell of the state railroad commission on the application of the traction company for an increase in passenger fares.

The commission's transportation engineer, J. G. Hunter, recommends in the report that the valuation figure be used as a base in determining any readjustment of rates.

Revenue from the system's operation is approximately $19,500,000 annually, of which approximately $12,250,000 is assignable to passenger operation alone. The report points out that of the passenger revenue approximately $8,250,000

is derived from interurban operations and $4,000,000 from local car service. The report also shows that during the last ten years passenger revenues have fallen off, probably on account of the greater use of automobiles.

Hunter estimates that the present earnings on the rate base he gave are 5.1 per cent, excluding material depreciation and other items. Including these items, Hunter stated the company will earn 2.6 per cent in 1928 on the estimated rate base.

Motor Trains Replace Steam

The Baltimore & Ohio is replacing all steam engines in passenger train service on the Shenandoah district of the Baltimore division with motor driven trains, as an economy measure following experiments conducted with gasoline motors on several of the heaviest trains between Strasburg Junction, Brunswick, Frederick and Hagerstown. Recently improved motors have been found to haul a coach with accommodations for 71 passengers and a combination baggage, express and mail car, on fairly good time, and in a number of instances heavy grades have been "taken," though with some apparent effort. Railroad men generally agree that much more powerful motors or steam locomotives will have to be utilized when express and mail matter and passenger traffic is unusually heavy, as during the fruit shipping seasons and the pre-holiday period.

Rock Island to Spend $17,500,000 in 1928

Word comes from Chicago that the Chicago, Rock Island & Pacific has appropriated $17,500,000 for improvements and equipment in 1928. Operating expenses incident to this improvement program are placed at $5,500,000. Only $100,000 for last year's improvement program, which amounted to $23,200,000, was carried over into this year. The program for 1928 includes $6,000,000 for roadway and improvements, $6,500,000 for new equipment, $1,650,000 for rehabilitation of equipment, and $3,300,000 for miscellaneous items. Purchase of 50,000 tons rails and 14 motor cars is included in the budget.

The Progress of Valuations

The Interstate Commerce Commission bureau of valuation, expects to have practically all primary valuations complete by June 30, Commissioner Lewis told the house appropriations committee. He estimated that the commission itself will have passed on nearly all valuations by the end of 1928. Tentative valuation work already is 100 per cent complete. Final valuations had been announced in 642 cases up to December 31, and 393 still were to be adopted as of that date. The valuation bureau is turning its attention to bringing the primary valuations up to date. The appropriations committee recommended that $2,200,000 be allowed for this work during the fiscal year, 1929. The committee was told that this work will be completed within three years.

The commission has reported final valuations, among others, on these roads: $1,697,000 on the East Broad Top Railroad & Coal Co., $1,333,249 on Susquehanna & New York R. R. and $1,101,305 on the Troy Union R. R., all as of June 30, 1917; $6,744,673 on the Kansas City, Mexico & Orient Railway Co. of Texas, as of June 30, 1919; $1,123,004 on the Minneapolis and Rainy River Railway as of June 30, 1915; $1,038,750 on the Norfolk & Portsmouth Belt Line, as of June 30, 1916; and $3,000 on the owned and used and $923,625 on the used but not owned property of the Railway Transfer Co. of Minneapolis, as of June 30, 1917; $527,500 on the Montana, Wyoming & Southern as of June 30, 1917; $4,850,000 for the Paducah & Illinois R. R. of Kentucky and Illinois as of 1919; as of June 30, 1918:

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Tonopah & Goldfield, $1,812,150; Birmingham & Southeastern, $702,060; Canton Railroad (Md.), $536,750; Hannibal Union Depot Co., $178,000, and Union Transportation Co. (N. J.), $46,422.

Final valuation on the Kansas City, Mexico & Orient Ry. of Texas, amounting to $6,744,673, as of June 30, 1919. The total compares with the corporation's outstanding capitalization of $8,520,813 and with its book investment of $6,874,185. The railroad is a subsidiary of the Kansas City, Mexico and Orient Company of Kansas, and controls 46 miles of track in Texas.

Medals Awarded Two Engineers

Medals for distinguished achievement in engineering have been awarded Gen. John J. Carty, vice president of the American Telephone and Telegraph Co., and Dr. William D. Coolidge, assistant director of the research laboratory of the General Electric Co. Gen. Carty will receive the John Fritz medal for "pioneer achievement in telephone engineering," and Dr. Coolidge the Edison medal "for his contributions to the incandescent lighting and X-ray arts," at the annual winter meeting of the American Institute of Electrical Engineers in New York, February 15. Previous recipients of the Fritz medal include Thomas A. Edison, Guglielmo Marconi, Orville Wright and Gen. George W. Goethals. The Edison medal has been awarded to Alexander Graham Bell. Prof. Michael I. Pupin, and George Westinghouse, among others.

The Frisco Is Speeding Its Freight

Forty-two hours fast freight service from St. Louis to Mobile, Ala., was established Feb. 1, by the Frisco Lines in connection with the Alabama, Tennessee & Northern Ry. The new service is made possible by the completion in January of the Frisco's rail-laying into Aliceville, Ala., where a connection is made with the A. T. & N. to Mobile. The 42 hour St. Louis-to-Mobile freight train will be known as Advance No. 835. It will leave St. Louis at 1:00 p. m., arriving in Mobile at 7:00 a. m. the second morning. Returning the train will leave Mobile at 6:00 p. m. arriving in St. Louis at noon the second day.

Canadian Railroad Transfer

Transfer of the provincial government railway lines of northern Alberta to the Canadian Pacific, Canadian National or a third private interest financed by British and American capital is expected soon to be announced. One of the two Canadian systems is expected to take over the system. They involve 1,500 miles of lines and equipment and by the construction of a 60-mile link on the extreme western terminus will supply a new outlet to the Pacific with existing rails. Premium Brownlee of Alberta is now in the East to complete the transfer.

Rail and Harbor Forces Near Agreement

After certain formalities said to interpose no obstacle to agreement, all the railroads operating in the Los Angeles harbor district are to be operated as a single system. Officials of the Southern Pacific, Union Pacific, Santa Fe and Pacific Electric have set in motion actions leading to the authorization of official signatures for the railroads.

The contract will merge some $59,000,000 of municipal and other railroad facilities in the harbor area into one system to serve all alike, and to eliminate some of the long-standing shipping grievances at the harbor. The move is declared to be the greatest harbor betterment since completion of the breakwater 16 years ago.

Why Not Join Them?

Declaring war on the motor bus lines operating between Philadelphia and South Jersey points, the Pennsylvania and Reading railroads made cuts in rates averaging 45 per cent effective January 22. The railroads stated that should the passenger traffic remain stationary, train schedules will be slashed and service reduced. If, however, the new rates serve as a stimulus to passenger traffic, the service of both roads will be bettered.

Railroad Employment Decreased

According to statistics compiled by the Interstate Commerce Commission from reports of 176 Class 1 railroads these carriers employed 1,783,542 persons during October, 1927, compared with 1,866,115 during October, 1926. Compensation paid in October totaled $255,656,707, against $263,068,531 in October, 1926.

Decrease in number of employes was distributed among all classes below "executives, officials and staff assistants," the largest decrease being in the equipment and stores group.

Atchison Stock Issue Approved

The Atchison, Topeka & Santa Fe has been authorized by the Interstate Commerce Commission to issue $9,296,400 of common stock which is to be sold at par to holders of the common stock and proceeds applied to retirement of underlying bonds.

Railway Construction

Tracks and Yards

ALBERTA.—The Canadian Pacific has given notice that it will apply to the next session of the Canadian parliament for permission to construct a line from Acme, Alta., on the Langdon-Kneehill branch to a point 25 miles northwest and a line from Rosemary, Alta., on the Bassano-Leader-Swift Current branch to a point 20 miles northwest. At the same time the company will apply for permission to issue securities not exceeding $40,000 per mile in amount to finance this construction.

CALIFORNIA.—After a year's deadlock the county supervisors at Fresno and the Southern Pacific have come to an agreement whereby six county roads will be closed so that the railroad may build classification yards at the northern limits of Fresno to cost about $2,000,000.

The principal condition laid down by the county supervisors was that the railroad pay $120,000 of the cost of construction of a subway under the railroad at Clinton avenue, the southern boundary of the new yards.

In consideration of the closing of the six highways, which cross the railroad yard site at 45 degree angles, the railroad agrees to build one and one-half miles of standard 60-foot highway paralleling the yards to connect the closed roads, to pay the subway cost, when the railroad commission deems the subway necessary, and to provide adequate safeguards for the grade crossings at the northern and southern crossings.

While no statement was forthcoming from railroad officials the fact that preliminary steps have been taken leads to the belief that one of the first steps in the development program will be the initiation of construction on the $500,000 icing plant for the Pacific Fruit Express. Assistant General Manager

White announced recently that the company will have to start construction work immediately if the plant is ready for service during the 1928 fruit shipping season.

MONTANA.—The Great Northern Ry. plans to construct a branch from either Beaverton, Mont., or Saco, on the main line to Turner, Mont., near the Canadian border, about 80 miles. If these plans are approved by the Interstate Commerce Commission and the board of railroad commissioners of Montana the line will furnish transportation to 61 townships in a fertile spring wheat territory. The cost of construction of the line is estimated at $2,000,000.

NEW YORK.—The new classification yards of the Boston & Maine at Mechanicville, N. Y., were opened January 14 by George Hannauer, president. With the pulling of a pin which sent a freight car rolling down the "hump," Mr. Hannauer put into permanent operation the facilities which will double the speed with which freight cars pass through this main gateway of the Boston & Maine between New England and the West and South. The ceremony was attended by officials of the New England Shippers' Advisory Board, the New England Traffic League, the New England Traffic Club, the New England Council, the New Hampshire Manufacturers' Association, the Associated Industries of Massachusetts and the Associated Industries of Maine, as well as city officials of Mechanicville and Troy, N. Y. The members of the party were then guests at an official luncheon in Troy tendered by Mayor C. F. Burns of that city and the Troy chamber of commerce.

NORTH CAROLINA.—The Carolina Power & Light Co. has appropriated $200,000 for improvements and further extension of its system in Asheville for 1928. The full program has not been completed, but extensions of the railway and possible improvements to the present office facilities will be included in the expansion.

SOUTH DAKOTA.—Approval of an application for permission to build 70 miles of new railroad line in South Dakota has been recommended to the Interstate Commerce Commission by O. D. Weed, commission examiner. The application was made by the Mound City & Eastern R. R. organized to build the line in question. The Great Northern and Soo Line railroads filed as interveners in the proceedings before the commission but did not actively oppose the application. The examiner's report held the increase in the prosperity of the farming area and the towns along the proposed line would confer benefits "outweighing any injury which the Great Northern and Soo Line might encounter" from the competition. The line would run from Mound City by way of Long Lake to Leola, South Dakota. Its estimated cost is $1,030,000 and a considerable portion of that amount is said to have been raised by subscription in the territory which would be served.

TEXAS.—Railroad extensions and new lines in Texas involving construction of 1,500 miles of track are in prospect. New railroad mileage in Texas last year amounted to approximately 500 miles, all extensions of existing systems. Only part of projected extensions were completed last year. This is true as to the Burlington's subsidiary lines in Northwest Texas and the new road of the Rock Island to run between Amarillo and Liberal, Kan. The Missouri Pacific and the Southern Pacific have yet to construct 50 miles of lines to round out their systems in the Lower Rio Grande Valley. The Quanah, Acme & Pacific, subsidiary of the St. Louis-San Francisco, will complete its extension from McBain to Floydada, 28 miles, early this year. It is expected this road will be extended west from Floydada to Carlsbad, N. M., and ultimately to El Paso.

Railroad construction projects apparently assured for 1928 include extensions in both directions of the Waco, Beaumont, Trinity & Sabine, one from Weldon to Waco and the other from Livingston to Port Arthur via Beaumont, the total proposed new mileage being 207; the Houston-Port Arthur, from Houston to Port Arthur, 85 miles; the Ardmore, Vernon & Lubbock, from Ardmore, Okla., to Lubbock, 225 miles; the Kansas City, Mexico & Orient, from Alpine to Presidio, 75 miles; Texas & Pacific branch line from Monahans to Kermit, 28 miles, with prospective further extension to the Maljamar oil fields in New Mexico, an additional 60 miles; Cisco & Northeastern, now owned by the Texas & Pacific, an extension of its line from Throckmorton to Haskell, 30 miles; Louisana Railway & Navigation Co., Greenville to Dallas, 40 miles; Gulf & West Texas, from San Antonio to San Angelo, 200 miles; Clinton & Oklahoma Western from a point on the Oklahoma-Texas border to Pampa, about 50 miles, exclusive of about 50 miles extension to be built in Oklahoma; Missouri-Kansas-Texas from San Antonio to a point on the Rio Grande, approximately 250 miles, with a prospective extension of its systems from Raton west to Roswell, N. M., about 180 miles.

No definite announcement has been made by Atchison, Topeka & Santa Fe as to its plans for extending its lines in Texas this year. It has under consideration a direct line between Post and Fort Worth, approximately 200 miles. It is believed the taking over by the Southern Pacific of the Texas-Midland Railroad running between Paris and Ennis, 124 miles, will call for an extension of the acquired line, probably from Paris north into Oklahoma.

WYOMING.—Permission to construct 54 miles of new lines in Wyoming has been granted the Union Pacific Railroad by the Interstate Commerce Commission, the extension to begin at Creighton, the present terminus of a Union Pacific branch, and run in a southerly direction to a point near Egbert.

Buildings and Structures

GEORGIA. — Thomaston. The Central of Georgia is planning new station facilities at this place, and construction of warehouses at Rome.

MASSACHUSETTS. — Allston. The Boston & Albany has awarded a contract to the Fairbanks, Morse Co., Chicago, for the construction of a 1000-ton coaling plant and a 750-ton sand house at Allston.

NEW JERSEY. — Newark. Officials of the city of Newark and the Newark chamber of commerce have united in favor of the erection of three bridges across the Passaic River in the Pennsylvania Railroad's plan to coordinate railroad, Hudson tube, trolley and bus traffic in connection with the new union station to be built in that city. The announcement was made at a joint hearing of the war department and the state board of commerce and navigation held there. Representatives of the Passaic chamber of commerce and of shipping material interests along the Passaic River opposed the plan, declaring that erection of the three bridges would hinder navigation on the Passaic.

PENNSYLVANIA.—Harrisburg. The Pennsylvania Railroad has awarded a contract to the James McGraw Company of Philadelphia for grading, masonry work and station platforms in connection with the new Market street subway at Harrisburg, which it is estimated, will cost $300,000. This company has also a contract for track work incident to changes required in connection with the construction of the subway referred to which is to cost $100,000.

TEXAS.—Houston. The Houston Electric Co. probably will spend $529,655 in 1928. The budget is for $125,000 more than that of last year. Principal items include removing the carhouse at Texas and Brazos and relocating on the old circus grounds on Silver and Sabine,

placing $181,000 worth of buses on the Harrisburg line, building a big garage at the Texas and Brazos carhouse and erecting a steel trestle over White Oak Bayou.

More land has been acquired by the company in the rear of its present carhouse at Texas and Brazos and the garage and machine shop will be built over all the area.

The interurban station and express house will remain on the present location. Contract for paving the gravel portion of Texas Avenue from Louisiana to the bayou and in front of the interurban office has been let.

WASHINGTON.—Tacoma. The board of contracts and awards will receive bids soon for a car house for the municipal belt line. Plans are for frame and timber construction to be completed within 45 days after contract is signed.

Locomotive Orders

The Class I railroads owned 60,845 locomotives Jan. 1, 1928, according to the A. R. A. This was a decrease of 3,721, or 5.8 per cent compared with January 1, 1923. The average tractive power, however, increased 4,982 pounds per locomotive or 13.2 per cent during this period, (and there are still many engines in service that don't help that average a whole whale of a lot). The report further states that the Class I roads placed in service in 1927 a total of 1,955 engines, a decrease of 444 compared with 1926, but an increase of 222 over 1925. These roads had 93 locomotives on order Jan. 1, 1928, compared with 329 on the same date a year ago.

Since our last issue the most outstanding inquiry to come into the market was that of the Union Pacific for 23 of their 9000-class locomotives, and 15 18,000-gallon capacity tenders. The 9000-class locomotives used by this road, with tender, are 102½ feet long, 16 feet 1½ inches high, and weigh about 784,000 pounds. The wheel arrangement is 4-12-2. The new engines will have tenders of larger capacity.

The budget of the Soo Line for 1928 provides for the purchase of nine large freight locomotives.

Other inquiries reported in the market are as follows: Seaboard Air Line, 25 Mikados; New York, Ontario & Western, four to six locomotives of 4-8-4 type; Great Northern, six Mallets.

Only scattered small orders were placed during January, the largest of these being the one for eight three-cylinder Pacific type engines placed with Baldwin by the government of Siam. Other orders received by Baldwin were: Quarahuy Eitaquy Estrado de Ferro of Brazil, one Pacific type; Sloss-Sheffield Steel & Iron Co., one consolidation type; Western Lumber Co., one Prairie type and Mud Valley Logging Co., one Mallet (2-6-6-2) type. The American Locomotive Co. has received an order for two three-cylinder Pacific type locomotives from the Mexican Railway, and an order for its Montreal works for two 2-8-4 engines from the Toronto, Hamilton & Buffalo.

George McCormick, superintendent of motive power of the Southern Pacific gave out a rather interesting statement in January when he said the road had purchased an average of one new locomotive every nine days for the last five years. This surely is a new method of figuring, and ought to help some of the dopesters down on Wall street who like to spend their time forecasting the future in the equipment market. We give up but we do think there will be a lot more locomotives ordered this year than in 1927. The record for that year, however, isn't much to beat.

The department of commerce says there were unfilled orders on the first of the year for 232 locomotives as compared with 398 on January 1, 1927.

Passenger Car Orders

Well, the passenger car builders and equipment men surely have no kick about not starting the year right. Some month January—nearly 40 per cent as many cars ordered in that one month as during the entire year 1927. Of course, however, there was one big contributing factor, the Pennsylvania's order for 613 cars, one of the largest orders ever placed if not the largest. It consisted of 300 coaches, 210 baggage and 103 miscellaneous cars. The orders were divided as follows: Standard Steel Car Co., 150 coaches; Bethlehem Steel Co., 88 coaches; Pressed Steel Car Co., 50 coaches; St. Louis Car Co., 85 baggage; American Car & Foundry Co., 75 baggage; J. G. Brill Co., 50 baggage; Electro-Motive Co., six gas-electric cars; J. G. Brill Co., seven gas-electric cars. The 20 combination passenger and baggage cars, 45 scenery cars, 25 horse express cars and 12 coaches will be built at the railroad's shops at Altoona. The Pennsylvania has ordered no wooden passenger cars since 1907, and decided to purchase sufficient additional all-steel passenger equipment this year to eliminate wooden cars from all regular steam passenger trains over its entire system. The road will ask for bids shortly for refrigerator cars that were not included in this order.

The American Car & Foundry Co. has received the following orders for passenger equipment cars besides the order for 75 baggage cars received from the Pennsylvania: Frisco, 15 combination baggage and mail and five baggage cars; Nashville, Chattanooga & St. Louis, two combination passenger and baggage and two steel baggage cars; Texas & Pacific, two business cars, three diners and five combination baggage and express cars; Long Island, ten baggage and two baggage and mail cars; New York Central, rebuilding thirty-three passenger coaches.

Other orders recently placed include the following: Western Pacific, four cafe cars from Pullman; Canadian Pacific, 15 horse cars from National Steel Car Co.; Mobile & Ohio, six steel coaches, three with partitions, from the Bethlehem Steel Co.; Southern, one additional combination baggage and mail car from Bethlehem; Pittsburgh Railways, 15 interurban cars from St. Louis Car Co.; Mobile & Ohio, three gas-electric cars (with Electro-Motive power plant) and three trailers from St. Louis Car Co.; Great Northern, five combination baggage and mail gas-electric cars from J. G. Brill; Burlington, 26 gas-electric cars from Pullman and 11 trailers to be built in its own shop at Aurora.

Inquiries have been issued for the following equipment: Union Pacific, 15 coaches, 10 diners, six gas-electric cars and eight mail and baggage trailers; Chicago & Alton, seven combination baggage and mail and two mail cars; Frisco, five gas-electric cars; Burlington, six baggage and three combination passenger and baggage cars.

The Market Street Railway, San Francisco, it is stated, will build 26 car bodies this year.

Freight Car Orders

Class I railroads installed in service 75,386 freight cars in 1927 according to reports for the year led by the carriers with the car service division of the American Railway Association. This was a decrease of 28,614 freight cars compared with the number installed in 1926 and a decrease of 53,036 under 1925. Of the 75,386 freight cars placed in service, box cars numbered 32,210; coal cars 29,060, and refrigerator cars 6,019. Despite the decrease in the number of cars installed in 1927, compared with the two previous years, the average carrying capacity per freight car on January 1, 1928, was 45.7 tons compared with 43.1 tons on January 1, 1923, an increase of 6.0 per cent. Freight cars on order by the Class I roads on January 1, this year, totaled 13,057 compared with 21,242 on the same day one year ago.

The largest freight car order placed during the past month was that of the Frisco for 4,000 cars. The order was divided among the builders as follows: American Car & Foundry, 1000 box and 500 hoppers; Pullman, 500 auto and 500 hoppers; General-American, 500 flat, 500 box and 500 hoppers. The road is also in the market for 30 air dump cars. The Texas & Pacific placed an order for 1000 cars. It was divided as follows: Pressed Steel Car, 500 gondolas; American Car & Fdry., 300 flats and 200 automobile cars.

The Chesapeake & Ohio gave an order for 500 70-ton steel hopper bottom gondola car bodies. The contract included removing and dismantling car bodies from trucks, cutting and loading the scrap and making the necessary repairs to the trucks. The contract for 300 of the cars was awarded to the Richmond Car Works, Richmond, Va., and for 200 to the Huntington plant of the American Car & Foundry Co. Other orders for cars were placed as follows: Canadian Pacific, 200 refrigerators from National Steel Car Corpn., and 300 automobile and 50 Hart-Otis ballast cars from Canadian Car & Foundry Co.; Louisville & Nashville, 100 ballast cars from Rodger Ballast Car Co.; Southern Railway, 500 additional automobile cars from American Car & Fdry.; the Texas Co., 200 tank cars from American Car & Fdry.; New England Fuel & Transportation Co., 50 mine cars from Bethlehem; Illinois Central, two air dump cars from Differential Steel Car Co.; Central of Georgia, 500 gondolas from Tennessee Coal, Iron & R.R. Co.; Texas & Pacific 10 caboose cars from American Car & Fdry.; Carnegie Steel Co., 35 tank cars from Standard Tank Car Co. and 15 from the Petroleum Iron Works; Otis Steel Co., six dump cars from the Clark Car Co.; Woodward Iron Co., 50 mine cars from American Car & Foundry; Great Northern, eight air dump cars from Koppel Industrial Car & Equipment Co.; Southern Ry., 20 side dump cars from Clark Car Co.; Fruit Growers Express, 240 refrigerator car underframes from Pressed Steel Car Co.; St. Louis Southwestern, six caboose underframes from Virginia Bridge & Iron Works; Bangor & Aroostook, 100 box cars to be built in its own shops; Sharpless Solvent Corpn., four tank cars from General-American; Lehigh & New England repairs to 250 hopper cars awarded to American Car & Fdry.; Norfolk & Western, 250 steel gondolas to be built at its Roanoke shops. The H. C. Frick Coke Co. has recently awarded the following orders for repairing hopper cars; Greenville Steel Car Co., 271 Standard Steel Car Co., 137; American Car & Fdry., 137. The Bay Terminal R. R. has recently applied to the I. C. C. for authority to issue $325,000 of equipment trust notes in order to purchase 200 tank cars from the Standard Tank Car Co.

Inquiries sent out recently were as follows: American Smelting & Refining Co., 60 gondolas; Union Pacific, 500 50-ton flat cars; South African Rys., 100 40-ton gondolas; Lake Superior & Ishpeming, 250 ore cars; Burlington, 150 ballast cars; Standard Oil Co. of N. J., 12 50-ton box cars; Frisco, 30 air dump cars; Southern Pacific, underframes and superstructure parts for 300 box cars; Manila R. R., 50 box cars; Chicago Great Western, 55 underframes; Republic Iron & Steel Co., 50 70-ton gondola bodies. In addition to these inquiries, the Chicago & Eastern Illinois has revised the specifications on its recent inquiry for 500 automobile cars, and the Lehigh & New England, is reported to have reinstated its inquiry for six caboose cars.

Changes in Personnel

Executive and Operating

E. H. Wright, office assistant to the general superintendent of transportation of the Kansas City Southern, has been promoted to the position of superintendent, southern division, Kansas City Southern and Texarkana & Fort Smith with headquarters at Texarkana, succeeding **W. N. Deramus**, who has been appointed general manager. Mr. Wright entered the service of the Kansas City Southern as conductor, June 17, 1903.

J. E. Kittrell, president of the Consolidated Coach Corpn., with headquarters at Lexington, Ky., has tendered his resignation to become effective as soon as a successor is selected.

Samuel Porcher has retired as assistant vice president of the Pennsylvania, in charge of purchases, stores and insurance, with headquarters at Philadelphia. Mr. Porcher was appointed to this position January 1, 1927.

H. L. Margetts, superintendent of the Canada division of the Michigan Central, with headquarters at St. Thomas, Ont., has been transferred in the same capacity to the west division, with headquarters at Chicago, succeeding **P. E. Pheifer**, who has resigned. He will be succeeded by **E. E. Wright**, now assistant superintendent of the middle division, with headquarters at Jackson Junction, Mich. Mr. Wright will be succeeded by **Frank McElroy**, now assistant superintendent at Niles, Mich.

The Oregon-Washington Railroad & Navigation Co., at Illwaco, Wash., has appointed **C. E. Stewart** general agent of the operating department to succeed **E. R. Budd**, retired.

R. J. Beilsmith has been appointed assistant superintendent of telegraph for the Wabash at Decatur, Ill.

E. W. McKinnon has been appointed acting superintendent, Island division of the Canadian National, in the place of **T. B. Grady** on leave of absence.

The Atlantic Coast Line has appointed **E. C. Garrabrant** superintendent of mail traffic to succeed **John DeWitt**, deceased.

W. T. Niles, passenger and freight agent on the Chicago & North Western at Casper, Wyo., has been appointed trainmaster on the Wyoming division.

The Chicago, Burlington & Quincy has promoted **R. N. Heisey**, general yard master at Kansas City, to be train master of the Kansas City terminal.

W. N. Hicks, joint agent of the Louisville & Nashville at Atlanta, Ga. has been promoted to general agent of the Atlanta joint terminals. **John R. Turner**, general yardmaster, has been promoted to superintendent of terminals at that point.

F. R. Gerard has been appointed superintendent of the Long Island, with headquarters at Jamaica, N. Y. succeeding **E. B. Kessler**, transferred.

F. A. Winterson, assistant superintendent of the Farnham division of the Canadian Pacific, with headquarters at Farnham, Que. has been transferred in the same capacity to the Smith's Falls division with headquarters at Smith's Falls, Ont., succeeding **E. J. Walker**. Mr. Walker succeeds Mr. Winterson as assistant superintendent at Farnham.

George M. Zimmer, assistant district superintendent of the Pullman Company at St. Louis, was promoted January 15 to district superintendent, with headquarters at Cincinnati.

The Milwaukee has promoted **D. E. Rossiter**, superintendent of the Coast division with headquarters at Tacoma, to general superintendent of the western

lines, with headquarters at Butte, Mont.

J. D. Moore, assistant superintendent of the Memphis division of the Missouri Pacific, with headquarters at Helena, Ark., retired from active service January 1 under the pension rules of the company.

A. V. Brown has been elected president of the Camas Prairie to succeed **J. P. O'Brien,** now general manager of the Oregon-Washington Railroad & Navigation Co., with headquarters at Portland.

The Waco, Beaumont, Trinity & Sabine, with headquarters at Houston, will have as executive vice president **T. A. Hamilton,** formerly president of the International-Great Northern. Mr. Hamilton will have charge of construction, operation and traffic. **J. M. Danner,** vice president, general manager and purchasing agent, with headquarters at Trinity, Tex. will remain in direct charge of operations. **P. T. Hubbell,** vice president, has been appointed assistant executive vice president with headquarters at Houston.

George L. R. French, assistant vice president and general manager of the Rutland will succeed **George T. Jarvis,** deceased, as vice president and general manager with headquarters at Rutland, Vt.

The Thorton & Alexandria has been purchased by business men of Little Rock, Ark., and the following officers elected: **L. E. Moore,** president, to succeed **W. C. Ribenack; Hugh Carter,** vice president; and **W. H. Holmes,** secretary.

The Pittsburgh, McKeesport & Youghiogheny has elected **J. B. Yohe** president. Mr. Yohe is vice president of the Pittsburgh & Lake Erie, the Pittsburgh, Chartiers & Youghiogheny and the Monongahela, with headquarters at Pittsburgh.

R. F. Angus has been appointed assistant superintendent of the Montreal Terminals division of the Canadian Pacific, with headquarters at Montreal, to succeed **F. Bisnett,** deceased.

A. H. Webb, special assistant to the vice president and general manager of the Missouri Pacific, has resigned.

P. E. Pfeifer, superintendent of the Chicago division of the Michigan Central, with headquarters at Chicago, has been appointed assistant to the general manager of the Boston & Maine, with headquarters at Boston.

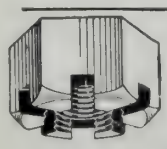
Wilson A. Jackson, assistant superintendent of telegraph of the Michigan Central, with headquarters at Detroit, will succeed **James J. Ross,** deceased, as joint superintendent of telegraph of the Michigan Central, the Great North Western Telegraph Co. and the Western Union Telegraph Co., with headquarters at the same point.

B. C. Murphy, trainmaster on the Paragould district of the Memphis division of the Missouri Pacific, with headquarters at Wynne, Ark., has been appointed acting trainmaster of the same district, between Helena Crossing, Ark., and Lexa Yard, the Latour, Clarendon and Brinkley districts and Helena terminal, with headquarters at Wynne, to succeed **T. R. Nash,** who is on leave of absence.

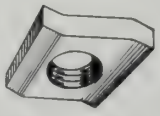
The Seaboard Air Line has announced the following changes: **J. C. Wroton,** transportation assistant to vice president at Savannah, has been appointed general superintendent of transportation; **H. B. Grimshaw** will succeed **S. M. Dutton** as superintendent of the Alabama division, with headquarters at Savannah. Mr. Dutton will succeed **Paul Hollis,** transferred, as terminal trainmaster in charge of the Savannah terminals. **O. R. Teague** will succeed **T. A. Norris** as superintendent of the East Carolina division, with headquarters at Charleston, S. C. Mr. Norris will succeed **W. R. Olive** as trainmaster of the North Carolina division, with headquarters at Hamlet, N. C. Mr. Olive has been appointed assistant trainmaster of the North Carolina division with headquarters at Hamlet.

COLUMBIA NUT & BOLT CO., Inc.
BRIDGEPORT, CONN.

ALSO U. S. S. SEMI-FINISHED AND U. S. S. SLOTTED NUTS



COLUMBIA "GIB" NUTLOCKS



Square

Hexagon

A "SAFETY" NUT LOCK

Apply with fingers till holding nut is met—then wrench. Note time saved—material saved—money saved—PIECE WORKERS like them.

COLUMBIA LOCK NUTS

A "SELF-LOCKING-NUT"

Standard sizes and dimensions. Easily applied without waste of time or injury to threads. CANNOT shake loose. FREIGHT CARS all over the country have them on. They have stood the test of years.

"This up-side-downness is at the request of the Advertiser: "Nuts is Nuts"

"Ask for a copy of the 'Bughouse Bugle' our newspaper."

'RALSTON BUILT'

Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
COLUMBUS, OHIO

T. A. Connor has been appointed assistant trainmaster of the Alabama division with headquarters at Bainbridge, Ga.

Owen O'Connor, trainmaster of the Harlem and Putnam divisions of the New York Central, with headquarters at White Plains, N. Y., has been appointed superintendent of that division with the same headquarters.

Luther Reynolds, general manager of the Gainesville & Northwestern, has resigned and will be succeeded by **Frank Lockhart**, with headquarters at Gainesville, Ga.

B. S. Baumann, trainmaster on the Los Angeles division of the Southern Pacific, with headquarters at Indio, has been appointed trainmaster, Shasta division, with headquarters at Redding. **B. W. Mitchell** will succeed Mr. Baumann as trainmaster on the Los Angeles division. **W. S. Ford** has been appointed trainmaster on the Rio Grande division, with headquarters at Douglas, Ariz. and the position held by Mr. Ford, that of terminal trainmaster at El Paso, has been abolished.

A. LeRoy Hodges has been appointed assistant general manager of the Brooklyn City Railroad, Brooklyn, N. Y.

J. B. Potter has resigned as manager of the Bridgeport and Norwalk divisions of the Connecticut Company's railway and bus lines to become general manager of the Wilkes-Barre Railway, Wilkes-Barre. **Frank L. Kibling** will succeed Mr. Potter at Bridgeport.

Leon O. Whitsell has been elected president of the California railroad commission for 1928 to succeed **Ezra W. Decoto.**

A. J. Rowe, assistant manager of the Northern Texas Traction Co., Fort Worth, has been made assistant superintendent of transportation.

J. H. Eddy has been appointed acting superintendent of terminals of the Southern Pacific at New Orleans, to succeed **P. B. Torian**, who is ill.

Financial and Legal

R. R. Vermillion retired January 1 as general attorney for Kansas of the St. Louis-San Francisco Ry., and will be succeeded by **W. F. Lilleston**, attorney of Wichita.

The Lehigh & New England R. R. with headquarters at Bethlehem, Pa. has appointed **C. A. Andrews** general auditor. His former position as auditor has been abolished.

G. W. Williams, assistant general auditor, Elgin, Joliet & Eastern with headquarters at Chicago, has been granted a leave of absence because of ill health. **C. G. Holm** will succeed him.

The Missouri Pacific has appointed **Thomas J. Cole** general attorney for Missouri with headquarters at St. Louis, to succeed **Judge J. F. Green** who retired under the pension rules of the company January 1. Mr. Cole was assistant general attorney. **T. S. Reed**, assistant real estate and tax agent, has been promoted to real estate and tax agent with headquarters at St. Louis, succeeding **J. M. Seibert**, who has retired under the pension rules.

Robert V. Fletcher, general solicitor, Illinois Central, has been elected general counsel with headquarters at Chicago.

Walter S. Horton, general counsel, Illinois Central, with headquarters at Chicago retired December 31.

H. W. Hudgens, chief claim agent, St. Louis-San Francisco with headquarters at St. Louis has been promoted to general claim agent, with headquarters at Springfield. **F. B. Holland** has been promoted from assistant chief claim agent to assistant general claim agent at Springfield, and **E. H. Carr** and **W. D. Steele**, district claim agents at Memphis and Monette respectively, have been promoted to assistant general claim agents at Springfield. The Frisco effected a general reorganization of its claim department, January 9, with the removal of the offices from St. Louis to Springfield. District offices at Memphis, Tenn., Cape Girardeau, Mo., and Monette and Ft. Smith, Ark., have been abolished.

J. M. Souby has been appointed valuation and commerce counsel, Union Pacific System, with offices in Omaha. After practicing law in Kansas City Mr. Souby served as commerce counsel of the Kansas City Southern until 1919 when he went to the Union Pacific as assistant valuation and commerce counsel.

The office of vice president, held by **H. A. Scandrett**, recently elected president of the Chicago Milwaukee, St. Paul and Pacific Ry. has been abolished.

Bruce E. Dwinell has been appointed general attorney, Rock Island Lines, with headquarters at Chicago.

Walton J. Wright, assistant general auditor, Missouri Pacific Ry. has been appointed local treasurer for that road at St. Louis. Mr. Wright is a Virginian, 59 years old. He entered Missouri Pacific service in 1887 as a clerk and in the passing years has been an agent, operator, traveling auditor, and from August, 1918, to February, 1920, was an auditor for the U. S. Railroad Administration.

J. C. Desautels has been appointed chief claim agent of the Montreal Tramways, Montreal.

L. J. Harris, district office manager in the sales department of the Georgia Power Co., Atlanta, has been appointed assistant to the treasurer.

P. B. Stofer and **G. T. Holbrook** have been appointed assistant controllers of the Southern Pacific with headquarters at New York.

Bruce E. Dinwell has been appointed general attorney for the Rock Island with headquarters at Chicago.

Purchases and Stores

The Seaboard Air Line has announced that **W. M. Portlock**, general storekeeper with headquarters at Portsmouth, Va., has been appointed purchasing agent. **T. A. Hodges**, assistant general storekeeper with headquarters at Jacksonville, Fla., has been appointed general storekeeper, with headquarters at Portsmouth, Va. The position of assistant general storekeeper at Jacksonville has been abolished. **A. E. Reid**, storekeeper at Savannah, has been transferred to Jacksonville, Fla. **L. H. Haynes**, storekeeper at Tampa, has been transferred to Savannah. **E. H. Austin**, storekeeper at Wildwood, Fla., has been transferred to Tampa and **F. B. Lewis** has been appointed storekeeper at Wildwood.

Traffic

The following Southern Pacific appointments have been announced: **J. D. Mason** has been appointed general passenger agent with headquarters at El Paso, with jurdidiction over territory as described in T. & N. O. R. R. Circular No. 1205-C, dated January 1, 1927, and Pacific Lines Circular No. 3397 dated December 31, 1926. **L. G. Rowell** has been appointed traveling passenger agent with headquarters at El Paso. **J. E. Monroe** has been appointed district passenger agent with headquarters at El Paso. **F. O. Stain** has been appointed traveling passenger agent with headquarters at El Paso. **H. D. McGregor** has been appointed assistant general passenger agent with headquarters at El Paso.

Seaboard Air Line changes: **H. B. Knight** has been appointed city freight agent at Birmingham; **G. S. Woodward** has been made traveling freight agent at Tallahassee, Fla., reporting to the general agent; **A. P. Courvoisie**, commercial agent with headquarters at Lake Walesen, Fla., has been transferred to the same position at Winter Haven. He will be succeeded by **T. F. Sharpless.** The office of traveling freight agent at Lake Wales has been abolished. **M. A. Calhoun** has been appointed division freight and passenger agent with headquarters at Columbus, Ga. The position of district freight and passenger agent has been abolished. **J. S. Tyler** has

been appointed commercial agent with headquarters at Bainbridge, Ga. **C. G. Alvarez** has been appointed commercial agent at Jacksonville, Fla. The office of city freight agent has been abolished.

The Kansas City Southern has appointed **J. Fielder** traveling freight agent and **T. F. Brennan** soliciting freight agent with headquarters at St. Louis. **F. W. Kershner** has been appointed soliciting freight agent with offices at Joplin, Mo. **L. S. Wickes** has been appointed commercial agent with headquarters at Oklahoma City.

C. W. Evers has been appointed general agent, freight department, Union Pacific System, with headquarters at Sioux City, Iowa. The position of traveling freight agent has been abolished.

The Buffalo, Rochester & Pittsburgh has appointed **Robert R. Williams** assistant general freight agent with headquarters at Pittsburgh, to succeed **J. C. Gross**, resigned. **Raymond W. Anderson** has been appointed assistant general freight agent, with headquarters at Rochester.

G. B. Wood, assistant to the president of the Kansas City Southern has been appointed general freight agent in charge of solicitation, with headquarters at Kansas City. Rates and divisions and relations with foreign lines will be taken charge of by **H. A. Wood**, general freight agent.

The Erie has appointed **W. F. Salters** as live stock agent, with headquarters at East Buffalo, in charge of live stock traffic in the Buffalo district. **H. B. Rogers**, chief agricultural agent of the Erie, with headquarters at Jamestown, N. Y., has been appointed general live stock agent, with headquarters at East Buffalo, in general charge of live stock traffic on the Erie.

Sterling Ruffin, general agent of the Norfolk & Western, with headquarters at Petersburg, Va., has retired and will be succeeded by **S. E. Sutherland.** Mr. Sutherland will report to the general freight agent and to the general passenger agent at Roanoke, on matters pertaining to traffic, and to the superintendent at Crewe, Va., on matters pertaining to transportation.

J. C. Gross, assistant general freight agent, Buffalo, Rochester & Pittsburgh, with headquarters at Pittsburgh, has been appointed assistant general traffic manager of the Pittsburgh & West Virginia and the West Side Belt, with headquarters at the same point.

The Canadian National has appointed **C. W. Johnston**, passenger traffic manager with headquarters at Montreal, to the position of assistant general passenger traffic manager with the same headquarters.

J. J. Kavanaugh, general agent, freight and passenger department, Missouri Pacific, at Salt Lake City, will succeed **W. C. Staley** as general agent, freight department, Chicago. Mr. Staley has retired from active service.

The Denver & Rio Grande Western has given jurisdiction over the passenger traffic department to **H. I. Scofield**, general passenger agent. **F. A. Wadleigh**, passenger traffic manager, has retired. **W. W. Hatton** has been appointed assistant general passenger agent, with headquarters at Denver. The position of assistant to the passenger traffic manager at Denver has been abolished. **W. H. Cundey** is assigned to other duties.

J. N. McBride, general agricultural agent, Seaboard Air Line, with headquarters at Savannah, has been appointed general agricultural and land settlement agent. **Clement S. Ucker**, director of development, with headquarters at Savannah, has resigned. The offices of general agricultural agent and of director of development have been abolished.

The Canadian Pacific has appointed **A. Ledingham** assistant general freight agent of the Western lines with headquarters at Winnipeg.

Roy Pope, assistant general freight agent, Atlanta, Birmingham & Coast, with headquarters at Atlanta, has been appointed general freight agent with the same headquarters.

Jack T. Paris, commercial agent, Chicago & Eastern Illinois at Shreveport, has been promoted to general agent at Tulsa, succeeding **R. E. Dirhold** who has resigned to accept service with another company. **Elbert McCaa** will succeed Mr. Paris as commercial agent. **Frank E. Rush**, commercial agent at Chicago, has been promoted to general agent at Kansas City, succeeding **John G. Meehan**, who has been transferred to Jacksonville, Fla.

R. L. Burnap, formerly freight traffic manager of the Grand Trunk at Chicago has been appointed assistant general freight manager, Canadian National, with jurisdiction in the United States west of Detroit and the St. Clair River.

E. F. Flynn, formerly general freight agent, Grand Trunk, Chicago, becomes freight traffic manager of the Grand Trunk, western system, headquarters, Chicago. **James Cameron**, assistant general freight agent, Grand Trunk, Chicago, becomes general freight agent, Chicago, of the same system.

M. E. McRae has been appointed traveling freight agent of the Seaboard Air Line with headquarters at Cordele, Ga., reporting to the commercial agent, to succeed **J. S. Tyler**, promoted.

E. E. Nelson has been appointed passenger traffic manager of the Northern Pacific with headquarters at St. Paul to succeed **A. B. Smith**, retired. Mr. Nelson was assistant general passenger agent at Seattle.

Joseph P. Roddy, general agent of the Northern Pacific at Los Angeles has been appointed general agent for the same company at San Francisco.

E. F. Bertling has been appointed general agent of the Missouri Pacific, with headquarters at Salt Lake City.

The titles of **R. A. Webster**, Davenport, Iowa; **James Turnbull**, Los Angeles; **F. H. Stocker**, San Francisco; and **E. F. Schier**, Seattle, of the New York, Chicago & St. Louis have been changed from district traffic agent of Nickel Plate district to general agents of the traffic department of the Nickel Plate System. The titles of **V. B. Sharritts**, Indianapolis; **J. L. Dease**, Kansas City, Mo.; **J. R. Holcomb**, Louisville; **W. S. Nunnery**, Memphis; **J. C. Dougall**, Milwaukee; **W. H. Kelly**, Minneapolis, and **H. S. Lewis**, St. Louis, district traffic agents for the Nickel Plate district have been changed to general agents of the traffic department of the Nickel Plate district. The titles of **R. F. Waughop**, St. Louis; **T. J. Faulkoner**, Pittsburgh; **M. M. Clements**, New York; **J. K. Leigh**, Minneapolis; **Alan Du Quesnay**, Memphis; **W. A. McGowan**, Kansas City, and **W. B. Robbins**, Detroit, Mich., district freight agents of the Lake Erie and Western district, have been changed to general agents of the freight department of the same district.

Mechanical

The Erie has appointed **George Thibaut**, shop superintendent, with headquarters at Meadville, Pa., to the position of assistant mechanical superintendent, New York district, with headquarters at Jersey City. **T. F. Gorman**, master mechanic, Meadville division, has been appointed shop superintendent, with headquarters at Meadville, to succeed Mr. Thibaut. **W. E. Harmison**, master mechanic, Delaware and Wyoming divisions, Wilkes-Barre & Eastern, with headquarters at Port Jervis, N. Y., has been transferred to succeed Mr. Gorman. Mr. Harmison will be succeeded by **J. H. Winfield**, now general inspector of the eastern district, with headquarters at Hornell, N. Y.

H. Smith has been appointed master mechanic of the London division, Canadian Pacific, with headquarters at London, Ont., to succeed **E. J. Bowie**, promoted.

T. C. Armstrong retired January 1 as master car builder, western lines, Canadian Pacific, with headquarters at Win-

nipeg, and will be succeeded by **W. G. Stenason,** general air brake inspector.

M. F. Covert, superintendent, car department, Chicago Great Western, with headquarters at Oelwein, Iowa, resigned January 1 to become superintendent of the car department of the Quaker City Refrigerator line, the Quaker City Tank line and the Quaker Petroleum Co., with headquarters at Chicago. Mr. Covert will be succeeded by **B. H. McKarrel,** car foreman of the Chicago Great Western at Chicago.

Civil

Moses Burpee, who has retired as chief engineer of the Bangor & Aroostook R. R. with headquarters at Houlton, Maine, has been appointed consulting engineer to the same road with the same headquarters.

Mr. Burpee was born at Sheffield, N. B. in 1847. He entered railway service in 1869, as rodman on the European & North American (now part of the Atlantic division of the Canadian Pacific) and served as junior assistant until November of that year. On the opening of the road, he was appointed agent at one of its stations. The following summer he was engaged in the field as engineer until the fall of 1871, when he went to the Prince Edward Island Ry. (now part of the Canadian National System). After a short engagement, he returned to New Brunswick as locating engineer for the New Brunswick Ry. (now part of the Canadian Pacific) and served here in location and construction work until December 1877.

In April 1879, he was employed with the Milwaukee as draftsman in the field office at Canton, S. D., under the late F. W. Kimball, engineer in charge of construction extensions of the I. & D. division. The following year he was appointed locating engineer on extension at Ortonville, Minn., west, north and south from Aberdeen, and in 1882 was assistant on construction of the Council Bluffs extension in Iowa; in the spring of 1883 he surveyed some short branch lines in northwest Illinois. In the summer of the same year he went to the Canadian Pacific on construction of line from Maple Creek to Calgary, and in the fall of that year made surveys on the Manitoba South Western of the Canadian Pacific, returning east in December. In 1884 Mr. Burpee made surveys for the Central of New Brunswick and for the International Ry. in Maine (now a part of the Canadian Pacific). From 1885 until 1891 he was chief engineer of the New Brunswick Ry. and from May 1891 to December 31, 1927,

Moses Burpee.

chief engineer of the Bangor & Aroostook, completing 36 years of service with this company.

During 59 years of experience, Mr. Burpee has seen many an evolution in railway progress; the transition from iron rails, first to steel 30, 40, 50 and 60 lbs. a yard and then to 100 lbs. and up; from wooden bridges to those of steel and concrete; and from locomotives of 30 and 40 tons to those of 350 tons.

W. S. Johns, Jr. division engineer, St. Louis division of the Pennsylvania, has been appointed engineer, maintenance of way, western region, with headquarters at Chicago. **C. E. Adams,** supervisor, eastern division, will succeed Mr. Johns, with headquarters at Terre Haute, Ind.

C. D. Cronk, assistant signal engineer of the New York Central, lines west of Buffalo, with headquarters at Cleveland, has been appointed assistant signal engineer of the Cleveland Union Terminals Co. in charge of signaling with headquarters at Cleveland.

The Baltimore & Ohio has announced that **George H. Dryden,** principal assistant signal engineer with headquarters at Baltimore, has been appointed signal engineer with the same headquarters, to succeed **F. P. Patenall,** deceased.

G. E. Beck, chief signal inspector of the New York Central, lines west of Buffalo, with headquarters at Cleveland, has been appointed assistant to the signal engineer of the lines west of Buffalo, with headquarters at the same point.

G. J. Adamson, division engineer of the Union Pacific, western division, with headquarters at Green River, Wyo., has been promoted to assistant chief engineer of the Union Pacific and the St. Joseph & Grand Island, with headquarters at Omaha, Neb.

Samuel A. Hughes of St. Louis, colonization agent of the Frisco Lines, and for 48 years a Frisco employe and officer, retired January 25 because of disability following a long illness this winter. Mr. Hughes entered the Frisco service as a telegrapher in 1879.

Charles R. Smurr, industrial agent, Southern Pacific at Los Angeles, has resigned to accept a municipal post. **L. E. Light,** district freight agent at Los Angeles, has been appointed industrial agent for the Southern California district. **H. A. Hansen,** district freight agent at Santa Barbara, has been appointed district freight and passenger agent at El Centro. **J. W. Donohue,** traveling agent at Santa Barbara, will succeed Mr. Hansen.

John H. Hayes, roadmaster of the Northern Pacific at Moscow, Idaho, has been transferred to the Camas Prairie Ry. at Lewiston, Idaho. The position of roadmaster at Moscow has been abolished.

P. G. Burns, chief engineer, Trinity & Brazos Valley, has been appointed chief engineer in charge of construction and maintenance of the Waco, Beaumont, Trinity & Sabine, with headquarters at Houston. **Horace Beyett** has been appointed assistant to the chief engineer, with headquarters at Trinity, Tex.

F. R. Stevens, principal assistant engineer of the Rutland, with headquarters at Rutland, Vt., has been appointed office and valuation engineer, with the same headquarters. **Alan T. Danver,** acting supervisor of bridges and buildings of the Rutland has been appointed principal assistant engineer, with headquarters at Rutland, Vt.

J. C. White, supervisor at Tyrone, of the Pennsylvania, has been appointed division engineer of the Richmond division, vice **J. T. Ridgely,** promoted to engineer, maintenance of way, Long Island Railroad, with headquarters at Jamaica, N. Y. Mr. Ridgely will succeed **G. P. Williams,** transferred.

J. A. Prickett, right of way agent, Missouri Pacific, with headquarters at St. Louis, retired January 1. He was succeeded by **V. I. Nettleton,** assistant right of way agent.

Einar Weidemann, assistant engineer of bridges, Pennsylvania Railroad, with headquarters at Chicago, has been promoted to engineer of bridges and buildings. **T. H. Miller,** assistant, engineer corps, has been appointed assistant to the division engineer, St. Louis division.

William A. James, assistant chief engineer, Canadian Pacific, western lines,

with headquarters at Winnipeg, retired December 31.

John Feild, assistant engineer of the Norfolk & Western, with headquarters at Roanoke, Va. retired December 1.

The Utah Railway has appointed **Charles E. Beveridge**, engineering department, Union Pacific, Green River, Wyo., as engineer of maintenance of way with headquarters at Price, Utah.

Obituary

Major General George W. Goethals, builder of the Panama Canal, died in New York January 21, after a short illness, the nature of which was not disclosed.

General Goethals was chief engineer of the Panama Canal from 1907 to 1914, and the first civil governor of the Panama Canal zone from 1914 to 1916. During his army career he occupied various important posts, retiring in March, 1919, to devote his attention to his private practice as an engineer.

After his retirement from active service with the army he dropped out of the public eye to a great extent, but continued as consulting engineer with offices in New York. He was one of the principal advisers of the port of New York authority during the construction of the Holland vehicular tunnel.

He also was an adviser of the port authority in its other projects, including bridges now being built between Staten Island and New Jersey and the proposed bridge across the Hudson to Fort Lee, N. J.

General Goethals was born Brooklyn, N. Y., June 29, 1858. His early education was obtained there and also in the City College of New York, following which he was appointed to the United States Military Academy at West Point, where he was graduated in 1880 as a second lieutenant in the engineering corps. From then on his promotion was rapid, until he received, in 1915, the rank of major general.

General Goethals was buried, January 24, at West Point in the historic post cemetery overlooking the Hudson River.

Edward L. Ryerson, chairman of the board of directors of Joseph T. Ryerson & Son, Inc., died at his home in Chicago January 19.

B. F. Porter, formerly assistant general manager of the Northwestern Pacific, in charge of the Northern division, died at San Francisco on January 5.

C. E. Horning, assistant general passenger agent of the Canadian National, with headquarters at Toronto, died at his home in that city January 19.

L. G. Ogden, vice president in charge of finance of the Canadian Pacific died at his home in Montreal, February 5. Mr. Ogden was with the Canadian Pacific 45 years.

F. P. Patenall, signal engineer of the Baltimore & Ohio, died at Baltimore, January 11, aged 63, after an illness of several months. Mr. Patenall was born in England in 1864, and was educated there. He entered railroad service with the Lancashire & Yorkshire Ry. in England in 1881 as a bill clerk. His first position with the Baltimore & Ohio was in 1888 as supervisor of signals. He was promoted in 1891 to superintendent of signals, becoming signal engineer in 1898. He was a member of the

F. P. Patenall, Late Signal Engineer, B & O R. R.

American Railway Engineering Association, the signal section of the American Railway Association and the Institution of Railway Signal Engineers of England.

C. F. W. Felt, 63 years old, Chicago, chief engineer for the Santa Fe System, and an international authority on railroad engineering, died February 4 at Colorado Springs. He was president of the American Railway Engineering Association, 1926-27.

Mr. Felt was born April 29, 1864, at Salem, Mass. He was graduated in 1886 from the Massachusetts Agricultural College with the degree of B. S., and almost immediately began work in the engineering department of the Santa Fe System as an axman. Following two years with that company he was employed in engineering work for the D. & R. G. W., the Arizona & Southeastern, the Topolobampo Railway, Mexico, and several other western lines, finally returning to the Santa Fe as chief engineer after filling several positions with some of its subsidiaries, in 1909. He was a member of numerous scientific organizations and engineering societies. Mr. Felt married, in 1904, Miss Clara C. Root at Galveston, Tex.

Thomas W. Moses, city passenger agent of the Santa Fe died, January 18, at the Santa Fe Hospital at Los Angeles. Mr. Moses had been with the Santa Fe for 38 years. He was 60 years old.

Charles Marshall, superintendent of the New Orleans and Mobile division of the Louisville & Nashville from 1887 until he retired in 1917, died, January 14, at his home in Bay St. Louis, Miss. He was 79 years old. Mr. Marshall spent more than 50 years with the Louisville & Nashville.

Benjamin F. Jones, Jr. died at his home in Pittsburgh, Pa. on January 1, aged 50. Mr. Jones was chairman of the board of directors of the Jones & Laughlin Steel Corpn. of which firm his father was the founder.

Spaulding E. Cooper, traveling freight agent of the Pacific Electric Ry. at Los Angeles, died January 17. Mr. Cooper has been with the company since 1906.

John W. Kearney, manager of publicity for the Missouri Pacific Lines, died at St. Luke's hospital, St. Louis, December 22, aged 61. He had held his position with the Missouri Pacific since 1911. Prior to that he had served 30 years in various capacities on the editorial staffs of St. Louis newspapers.

William Schwanhausser, chief engineer of Worthington Pump & Machinery Corpn., died January 17 at Peck Memorial Hospital, Brooklyn, after an illness of six months.

Garrett B. Wall, vice president of the Chesapeake & Ohio died at St. Augustine, Fla. January 26.

Ira Adelbert Place, senior law vice president of the New York Central Lines, died unexpectedly January 24, at his home in New York City, from thrombosis. Earlier in the day he had suffered a paralytic shock. Mr. Place had seemed in the best of health despite his 73 years. He had spoken, the day before his death, before the board of estimate of New York City in connection with plans for the development of the West Side.

Mr. Place was one of the most widely known railroad officers in the East. His legal attainments were of the highest order, and his genial disposition and generous nature had made for him a host of friends in the legal profession and among government officials as well as among railroad men and the public in general. He had been in the law department of the New York Central since 1886, rising through various posts until he became its head. His wise counsel

and great learning had a conspicuous share in the New York Central's achievements for the past two decades or more. Grand Central Terminal and the surrounding magnificent improvements in this district stand as a monument to him.

Mr. Place was born in New York City, May 8, 1854, and passed his boyhood at Alfred, N. Y. He was graduated from Cornell as a Bachelor of Arts in 1881, and was admitted to the bar in 1883. Soon after graduation he entered the law department of the West Shore Railroad, now part of the New York Central. Three years later he became a member of the law department of the New York Central & Hudson River R. R., rising to the post of assistant to general counsel. In November, 1902, he was appointed general attorney for the company. Two years later he was made general counsel of the New York Central, east of Buffalo, and on December 5, 1906, became vice president in charge of law, land, tax and claim departments. He served as vice president of the New York Central from 1914 to 1919 and as general solicitor of the same railroad under the United States Railroad Administration in 1919 and the early part of 1920. In March, 1920, he was made vice president, New York Central Lines, and on June 1, 1927, was appointed senior law vice president of the New York Central, the Michigan Central, the Cleveland, Cincinnati, Chicago & St. Louis, and the Pittsburgh & Lake Erie.

Ira A. Place.

On his seventieth birthday, May 8, 1924, Mr. Place was a guest of honor at a testimonial dinner tendered by associates of the various departments under his jurisdiction and other railroad officials, headed by P. E. Crowley, president of the New York Central Lines, at the Hotel Biltmore, New York. More than 200 persons were present, and a handsome silver service was presented to Mr. Place as a token of the affection and esteem in which he was held. At the dinner Mr. Place revealed that his youthful ambition had been to be a journalist. After working as a farmer, a shopman, a printing press man and compositor the opportunity was given him to be editor of his college paper. He had proved a failure at this work, he said, whereupon he studied law and entered legal practice at Syracuse, New York.

Supply Trade Notes

H. F. T. Erben, assistant vice president of the General Electric Co., retired January 1 after more than 40 years service. He was also vice chairman of the General Electric manufacturing committee. **B. L. Delack** has been appointed manager of the Schenectady plant and **E. A. Wagner** manager of the Pittsfield, Mass., plant of the company. Sales organization changes include the appointment of **C. N. Gregory** as manager of the New Haven office, succeeding **Frederic Cutts,** and **R. B. Ransom** as resident agent in charge of the Hartford office, succeeding Mr. Gregory.

The **Rome Wire Company** division of the General Cable Corpn. has appointed **Jenkins & Gunther,** Santa Fe building, Dallas, as sales agents.

W. A. Spuehler has been elected vice president and treasurer of the **Burnside Steel Foundry Co.,** Chicago to succeed **George L. Pollock.** His former position as secretary will be filled by **H. J. Finlay.**

P. C. Brooks has been elected vice president of **Fairbanks, Morse & Co.** Mr. Brooks is also president of **E. T. Fairbanks & Co.,** scale manufacturing subsidiary of Fairbanks, Morse & Co., and vice president of the **Canadian Fairbanks, Morse Co., Ltd.**

K. V. Farmer, H. H. Hoxie, J. A. Whatley and **G. W. Willis,** sales representatives of the **Ohio Brass Co.,** Mansfield, Ohio, now have their headquarters at 721 Healy building, Atlanta, where a southern branch of that company has been opened.

The **Birdsboro Steel Foundry & Machine Co.,** Birdsboro, Pa. has appointed **Charles H. Leinert,** president of the **Leinert Valve Co., Inc.,** with offices at 310 South Michigan Avenue, district representative at Chicago.

All of the assets and real estate of the **National Car Coupler Co.,** Attica, Ind., have been acquired by the **Harrison Steel Castings Co.,** Attica. The plant will be operated under the same management and policies.

A. M. Anderson has been appointed sales engineer, railway department, western territory, of the **Gould Storage Battery Co., Inc.,** with headquarters at 32 West Randolph street, Chicago.

G. S. Garrick has been appointed general manager of the industrial department of the **American Arch Co., Inc.,** New York.

W. H. Davey, president of the **Mansfield Sheet & Tube Co.,** has been elected president of the Empire Sheet Steel Corp. **P. M. Carrick,** formerly of **Otis & Co.,** was elected secretary.

Jesse T. Hiller, for two years publicity director in the general bus department of the Mack-International Motor Truck Corpn., has resigned to become news editor of Bus Transportation, a McGraw-Hill publication.

George L. Pollock, vice president and treasurer of the **Burnside Steel Foundry Co.** since its organization, has resigned to become vice president of the **Nugent Steel Castings Company,** Chicago. Prior to becoming associated with the foundry industry, Mr. Pollock had been with the purchasing department of the Burlington and later served as purchasing agent of the Wheeling & Lake Erie, the Chicago & Western Indiana and the Belt Ry. of Chicago.

Pneumatic Self Propelled Compressors

The Chicago Pneumatic Tool Co. announces a new line of self propelled gasoline engine driven compressor cars for railroad use. The machines are built in sizes of 100, 160, 220 and 310 cu. ft. per minute displacement. They consist of the standard CP portable units set on a structural steel frame mounted on flanged wheels provided with Timken roller bearings, the use of which would make it possible to start the largest car rolling along a level track from a standstill with one hand. Flanged transverse

wheels, air operated lifting jacks and a transverse towing winch make it possible for one man to shift the car from the main line tracks to a siding in less than one minute. Equipment includes locomotive lifting bale, large equipment box, wide platforms which extend over the wheels on each side and trailer type drum brakes fitted to the two front wheels. The self propelling mechanism embodies a powerful two wheel drive which propels the car at a speed of 12 to 18 miles an hour.

Similar units are also available with the self propelling mechanism omitted, while skid mounted machines provided with a lifting bale can also be furnished. The compressor unit embodies the same distinctive features of the industrial CP portable compressor, including the famous Simplate valves, auto pneumatic throttle which slows down the engine when the compressor unloads, sectionalized radiator protected by stout steel bars, quickly detachable flexible coupling between the compressor and engine, and a one-piece cast steel deck on which the compressor, engine and accessories are rigidly mounted. These machines are described in detail in the Chicago Pneumatic Tool Co. Bulletin 789.

Announcement is made of the appointment of **A. L. Greenabaum** to be vice president of the **O. F. Jordan Co.**, manufacturers of the Jordan Spreader, East Chicago, Indiana. Mr. Greenabaum, heretofore, has been general sales manager of the company. Vice President Greenabaum has been identified with the O. F. Jordan Co. since 1920. Previously to that he was an official in the operating department of the Rock Island System. He is widely known in the railway appliance field and is vice president of the National Railway Appliance Association.

A. L. Greenabaum.

Frisco Acquisition Approved

The Interstate Commerce Commission has authorized the St. Louis-San Francisco & Texas Ry., to acquire and operate the 17 mile line of the Paris & Great Northern R. R., which extends from a point on the Red River to Paris, Tex.

The St. Louis company was authorized also to issue $171,000 capital stock and to assume obligation and liability in respect of $339,000 first mortgage 5 per cent gold bonds and $21,598 demand promissory notes of the Paris company.

Pennsylvania Has Been A Good Buy

The Pennsylvania Railroad distributed $34,948,599 in dividends to stockholders in every state in the union and nearly every quarter of the globe. With the four quarterly disbursements made in 1927, total cash dividends paid since the company's organization, 81 years ago, aggregate $849,308,034.62. Including stock and scrip dividends, and stock allotment rights, the total return to Pennsylvania share owners has been not much less than a billion dollars. Its total assets exceeded $2,500,000,000.

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

For detailed description see Car Builders Cyclopedia

CLARK CAR COMPANY
BALANCED DOOR DUMP CAR
PITTSBURGH, PA.

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Chicago, 557 Ry. Ex. Bldg. — New York, 52 Vanderbilt Ave. — Boston, 683 Atlantic Ave.

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This advertiser is now handling an outstanding account—has for years—very successfully, and can serve another advantageously to us both. Address B, C/O TRANSPORTATION, 1633 Monadnock Block, Chicago, Ill.

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Just Completed—the Outstanding Success of the City

THE BELVEDERE HOTEL

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Times Square's Finest Hotel—Within convenient walking distance to important business centers and theaters. Ideal transit facilities.

450 ROOMS —— 450 BATHS

Every room an outside room with two large windows; large single rooms size 11x6x20 with bath, $4.00 per day; for two, $5.00—twin beds, $6.00. Large double rooms, twin beds, bath, $6.00 per day. Special weekly rates. Furnished or unfurnished suites with serving pantries, $95 to $150 per month.

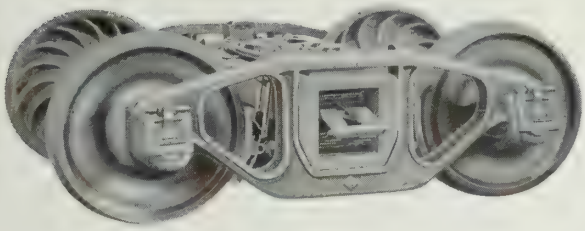
Moderately Priced Restaurant featuring a peerless cuisine.

Illustrated booklet free on request.

CURTIS A. HALE, Managing Director

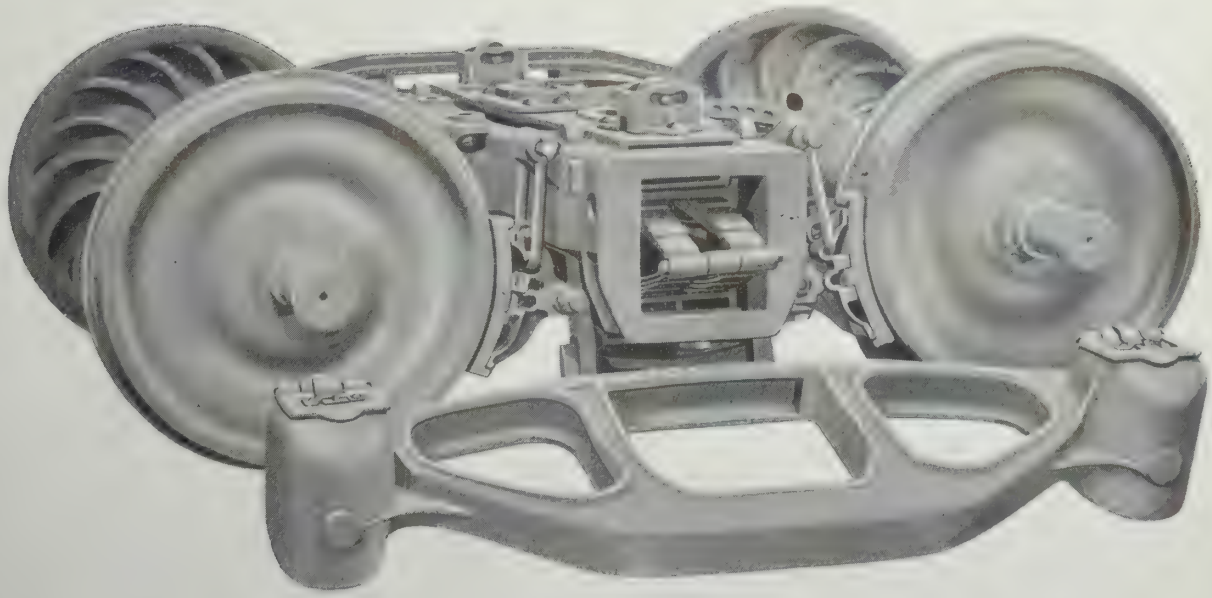
BETTENDORF PRESENTS

The
Swing Motion Caboose Car Truck with Cast Steel Transoms



Another BETTENDORF Improvement

THERE are, already, approximately 6000 caboose cars equipped with Bettendorf Swing Motion Caboose Car Trucks. We are now offering these same caboose car trucks with cast steel transoms; a valuable feature which adds strength and reduces the number of parts without increasing the weight or cost. It will be a pleasure to supply detailed information concerning these, the finest of caboose trucks.



THE BETTENDORF COMPANY

OFFICES AND WORKS BETTENDORF, IOWA

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ARE DRAFT GEARS
FOR?

Whether we test and analyze or experiment and calculate, we must remember always that the purpose of draft gears is to furnish

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To Cars and Lading.

For 25 years, through all the changing conditions of car operation and maintenance—through the increasing severities of car service—we have been furnishing

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DRAFT GEARS

to leading railways. During that time we have developed types A to L inclusive so that today type L represents the last word in draft gear protection for cars and lading.

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PROTECTION
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STANDARD COUPLER CO.
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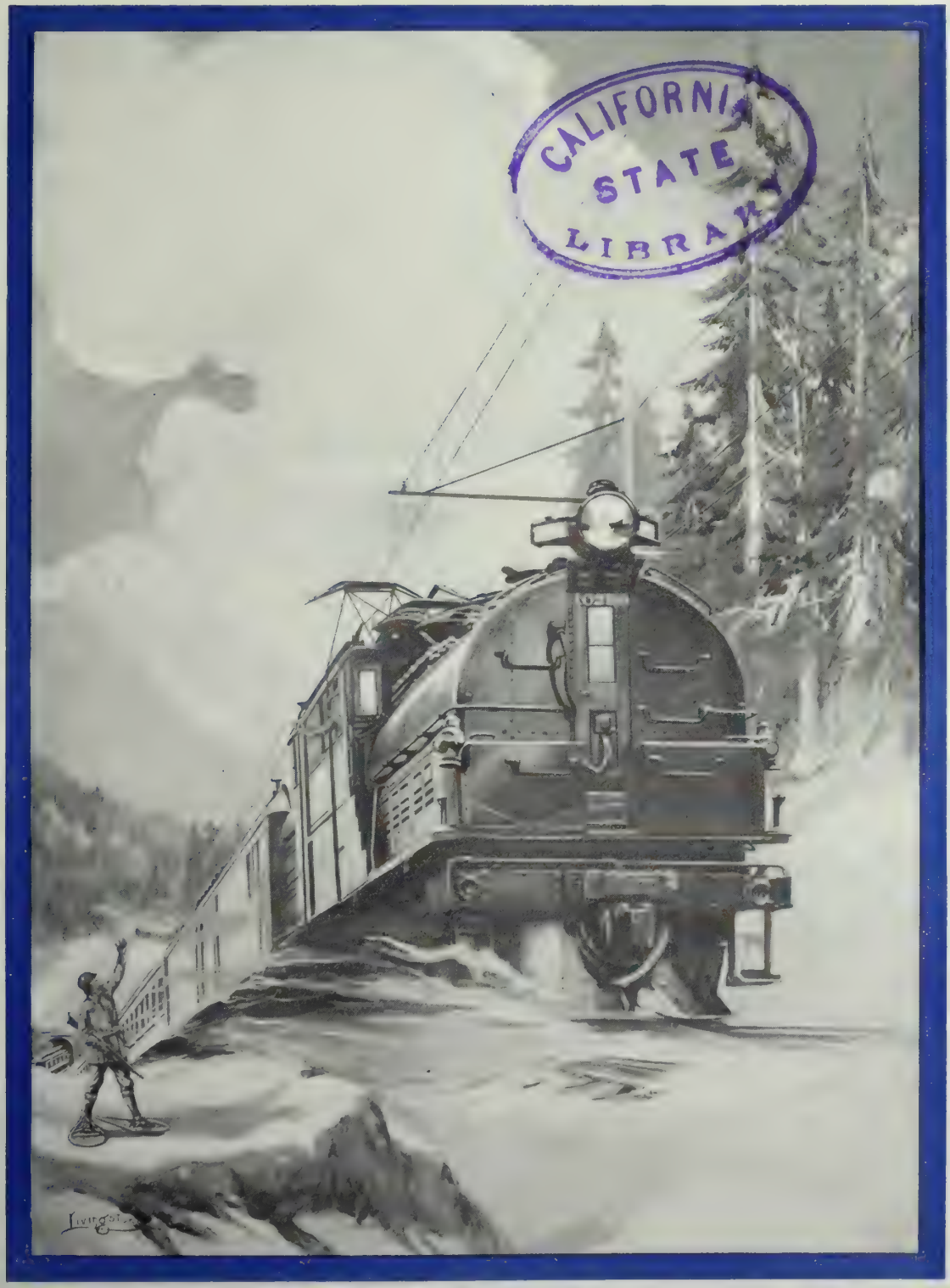
CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industry

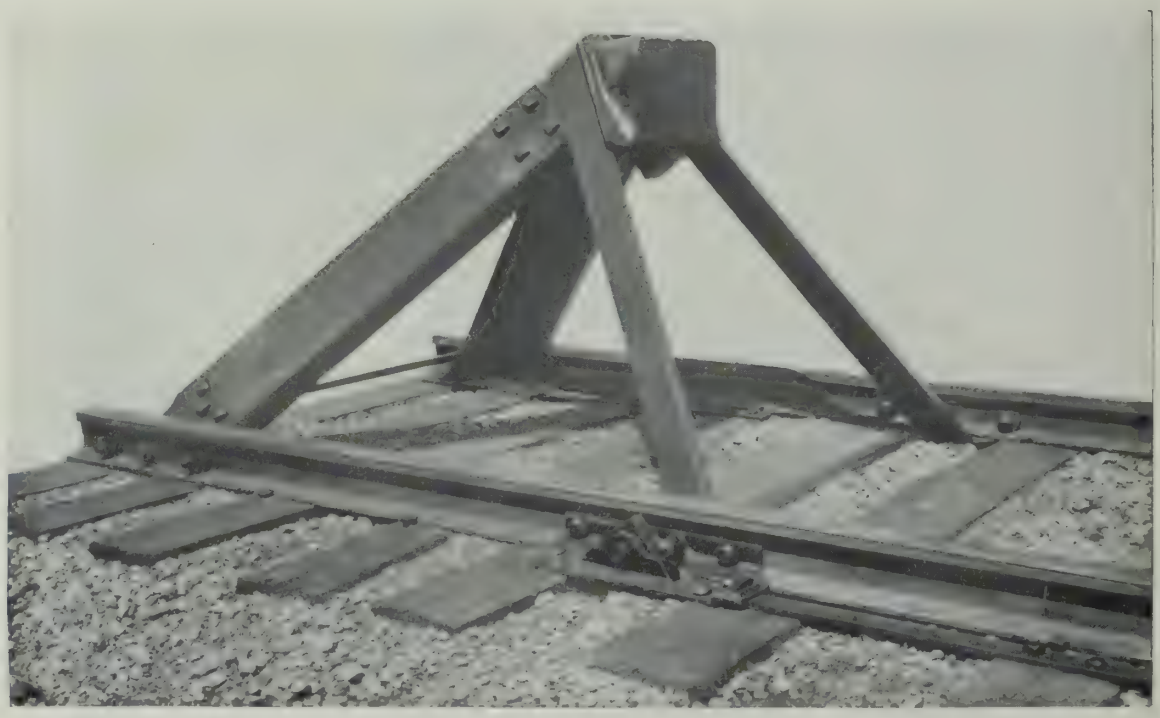


CALIFORNIA STATE LIBRARY

Vol. II March, 1928 No. 3

When you buy a Type W Post for a track you are through buying posts for *that* track.

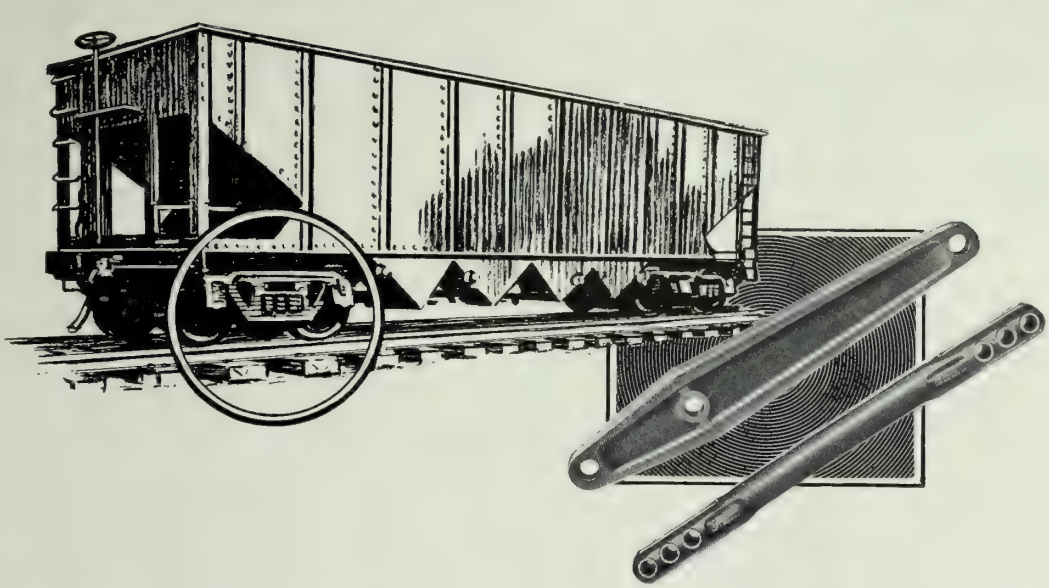
We base this statement on the fact that with over 1500 Hayes Type W Bumping Posts put in track during the past three years not one has been destroyed and scrapped.



Hayes

Hayes Track Appliance Co., Richmond, Indiana

Eliminate 94 Pounds Per Car—



And You Save Air and Reduce Wear

SCHAEFER Drop Forged Truck Levers, Body Levers and Truck Lever Connections are approximately one-third lighter (and 50% stronger) than ordinary solid forgings. Their use as a unit saves approximately 94 pounds in the weight of the foundation brake gear.

This substantial weight saving means a material decrease in the amount of air required to start and move the reciprocating parts.

The lighter weight, together with the use of special wear-resisting steel, reduces pin hole wear to the minimum.

If you are not familiar with Schaefer Drop Forged Foundation Brake Gear Details, write for illustrated bulletins and complete data.

Schaefer Drop Forged

Truck Lever Connections **Self-Locking Brake Beam Hangers**
Loop Brake Beam Hangers **Brake Levers** **Brake Rod Jaws**

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Fairmont

Price Knowing that Fairmont products deliver dependable service for years beyond normal expectancy, their cost has become a matter of secondary importance to the railroad industry. Steadily, improvements have been incorporated without corresponding increases in cost to railroads. This accomplishment is due in no small measure to the policy of serving but one industry. Greater sales volume absorbs part of the extra cost for the labor and time saving features to be had only in Fairmont railway motor cars.

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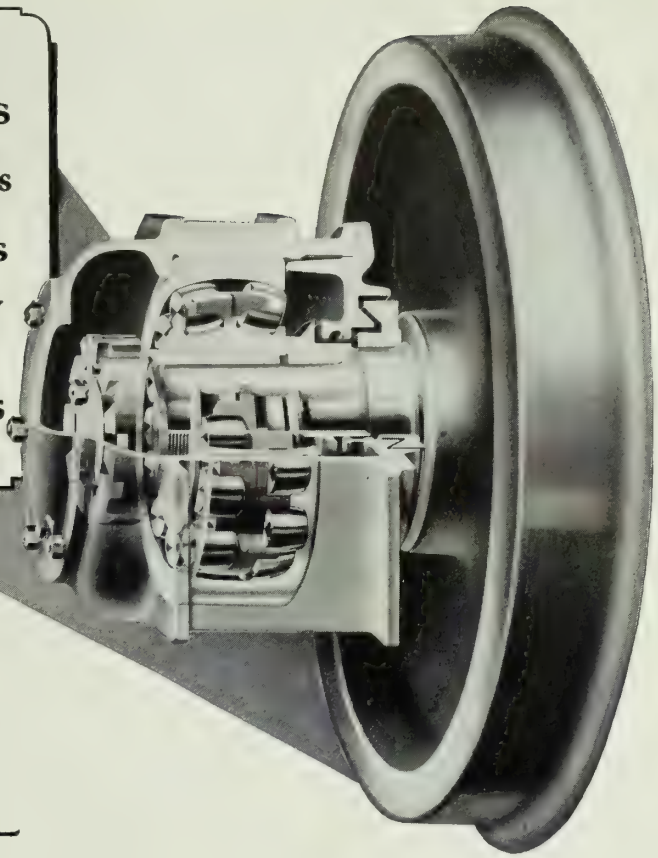
NOT
for a few months
FOR 12 YEARS
Not on a few journals
ON 25,000 JOURNALS
Not on a single Railroad
ON 35 RAILROADS
in
THIS COUNTRY
and
on the railroads
of
21 COUNTRIES
ABROAD
* As of December, 1927.



Lowest In Friction—

The SKF Journal Bearing

Excels All Others In Reducing Friction

IN the reduction of journal friction SKF goes further than any other railroad anti-friction bearing. It develops less friction than any other bearing now in use.

This has been thoroughly established by test. It is borne out by the lower running temperature of SKF Journal Bearings in daily service. Under a 90-ton car they show only 50 degrees rise above atmospheric temperature.

SKF Journal Bearings run cool because the rolling elements are not constrained and therefore are free to take the proper rolling position. They assume freely the constantly changing positions the axle is compelled to take with respect to the pedestals.

SKF
JOURNAL BEARINGS

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2002

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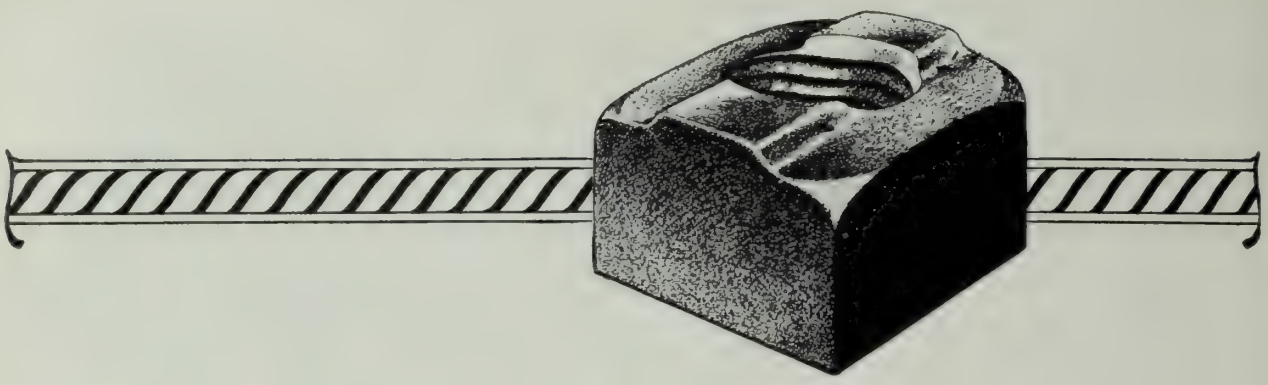
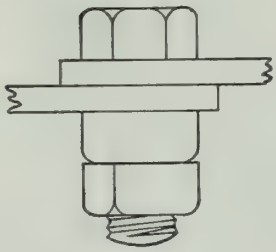
JOURNAL BEARINGS



The Grip "Unit" Nut Is The Modern Way

This Is Obsolete



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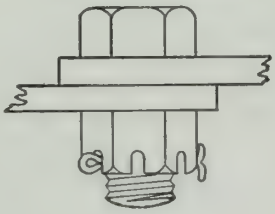
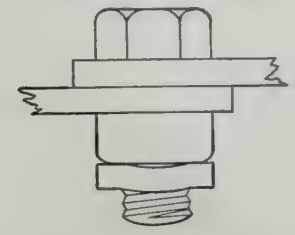


And So Is This



Double nut practice is obsolete. It wastes the cost of the second nut, the bolt length the second nut occupies and the labor of applying it. One Grip "Unit" Nut, because of its greater thread area, performs the job of holding and locking—and does it better than two common nuts ever did.

Castle nuts must be adjusted to fit the position of the cotter pin hole, whereas Grip "Unit" Nuts hold securely without this troublesome fitting, and cost a third less.

Of course, where a common nut is already in place, a Grip Lock Nut acts as a necessary safeguard. But on new work the Grip "Unit" Nut, combining the holding and locking functions, is more economical.

GRIP NUT COMPANY

5917 South Western Avenue, Chicago, Illinois

Transportation

The Monthly Magazine of the Transportation Industry

MARCH, 1928

VOLUME TWO NUMBER THREE

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How Others Have Reduced L. C. L. Handling Costs

Every official interested in lowering costs, in handling l. c. l. or carload freight, in or outbound, can profit from this book. It records the results of cost reduction effort in sixteen terminals. Agents themselves wrote it. All conditions of operation are included, and the remedies shown. Comparative costs are given.

Copies of this book will be gladly sent on request. Have your secretary write for yours today, that tomorrow you may have the data on the Portland Terminal, which shows a monthly rise in savings to over $4000.

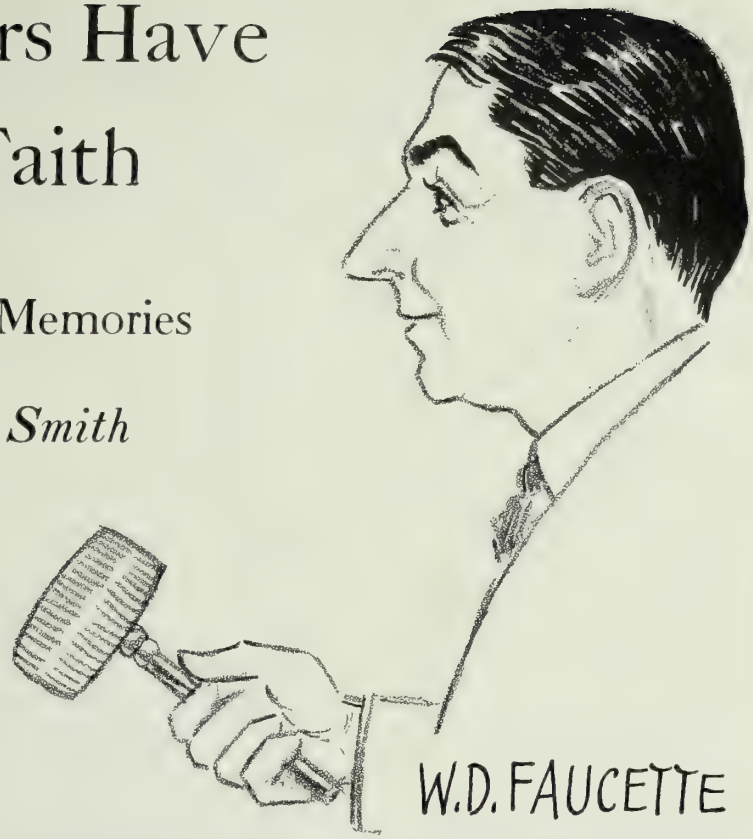
Mercury Manufacturing Company
4120 South Halsted Street
Chicago, Illinois

Mercury *Trackless Train*

How Engineers Have Kept the Faith

Some A. R. E. A. Memories

By Harold A. Smith



The Pleased Expression Came When His Old Committee Friends Gave Mr. Faucette a Banjo Clock Upon His Election to the Presidency. But the Artist Didn't See the Clock—Just the Gavel.

Well, this is the end of a perfect day,
  Near the end of a journey, too;
But it leaves a thought that is big and strong,
  With a wish that is kind and true.
For mem'ry has painted this perfect day
  With colors that never fade,
And we find, at the end of a perfect day,
  The soul of a friend we've made.

AND SO, tonight, as the twenty-ninth annual meeting of the American Railway Engineering Association closes, we rejoice at the end of a few perfect days. We are glad because of the friends we have made, because of the contacts established with these engineers — the empire builders. There is no end to the work, no completion of the subjects developed by this association. Each year only marks another milestone in the progress of engineering.

John F. Wallace, the first president of the A.R.E.A., said in his opening address, at the first convention held in Steinway Hall, Chicago, on March 14, 1900:

"The work of our association has been laid out along unique lines. It is the intention to cover the entire field of engineering and maintenance of way research, divide the subjects in systematic order, and continue and increase our standing committees and the subjects under consideration from time to time in order to do so. I should like to say in a general way that it was not the intention, nor is it possible, for any of these committees to exhaust the subject matter given them for consideration in a single year or even within the lifetime of the individual members."

How clearly he foresaw the work of this association! How well he and L. C. Fritch, the first secretary, planned and developed the first committees can best be realized when we see, today, how closely they still carry forward the original plans and purposes.

In 1899 there were 18 engineers at the meeting in the Iroquois Hotel at Buffalo when the association was organized. But the interest and recognition of the need for such an organization for study and interchange of engineering ideas was almost phenomenal, for at the first convention held in 1900 the attendance was 120. President Wallace said at that time, "You will note that our membership is intended to include two elements, the technical and the practical. It is hoped and expected that the intercourse between the two will be of mutual benefit, and that the technical man will become more practical and the practical man more technical through the interchange of ideas and information."

This year, 1928, there were 1271 members registered, and over 300 guests. At the annual dinner, given Wednesday evening, March 7, there were approximately 1000 in attendance. Singing and entertainment were provided liberally, and addresses were made by John A. Rowland, a member of the Toronto bar, and L. A. Downs, president of the Illinois Central R.R.

Mr. Rowland spoke of the part railroads had taken in developing Canada and this country, and the necessity of still further encouraging our mutual understandings and interests.

Mr. Downs said the possibilities for continued improvement in the railway field are by no means near exhaustion. "Science and experience," he said, "are steadily extending the boundaries of our knowledge and disclosing additional leads for exploration and exploitation. Research workers here and abroad are constantly seeking new materials and better ways of producing and of utilizing

D. J. BRUMLEY

materials already in use. Their work is being checked and supplemented by a multitude of tests and experiments carried on by experienced field men under actual service conditions. This great expenditure of thought and effort on the part of thousands of capable, enthusiastic technicians is bound to yield important results."

When the engineers' association was getting started, in 1900, he said, there were 193,000 miles of railroad in the United States. Ninety-five per cent of this mileage had been built during the last half of the Nineteenth Century, in many respects the most extraordinary period of expansion in the history of this or any other country. During that period the chief problem of railway engineers was to get the rails down and get them down as quickly as possible. In a large part of the country, railway development went in advance of agricultural, mineral and industrial development, so the builders had few reliable indications of future progress to guide them. They could not possibly do more than guess at what was going to happen —what factors would cause one community to become a great industrial center and another to remain stationary or fall into decay, what railroad would prosper and another fall behind.

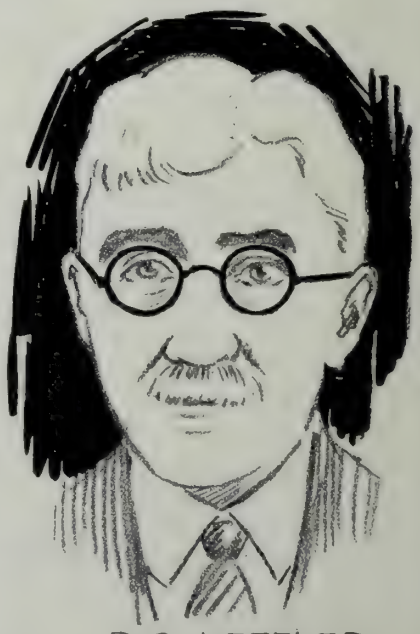
"My own road is an example," said he. "The original Illinois Central was conceived in 1835. Its purposes were to provide a route connecting the western terminus of the proposed Illinois and Michigan Canal at LaSalle with the head of year-round navigation on the Mississippi River at Cairo, to promote the development of the interior of Illinois and, incidentally, to increase the accessibility of Vandalia, then the capital of the state. Fifteen years later, in 1850, the plans were revised to provide for branch lines from the western terminus of the Illinois and Michigan Canal to a point opposite Dubuque and from Centralia to Chicago.

"At that time Chicago had fewer than 30,000 inhabitants. No one had an idea the city would develop into an industrial and commercial center of great importance. Galena, on the Dubuque branch, was the second city in the state, and was regarded as having a great future. It was believed by many at that time that Cairo, because it was at the confluence of the Ohio and Mississippi Rivers, at the southern terminus of the Illinois Central and at the head of year-round navigation on the Mississippi, was to become the great commercial metropolis of the Mississippi Valley. This belief led the builders of the Illinois Central to acquire more extensive holdings at Cairo than at Chicago, and to invest large sums of money there for the construction of levees, warehouses and terminal facilities.

"But note what has occurred. The Illinois and Michigan Canal is no longer used—in fact, is almost forgotten. Galena is exceeded in population by 91 cities in Illinois. Cairo has a population of 15,000, while Chicago, to which the Illinois Central built a branch line, is the second largest city on the North American continent. Meanwhile, largely as a result of conditions and developments unforeseen by its builders, the Illinois Central has grown from a 705-mile road in Illinois to a 9000-mile system in 15 states of the Middle West and the South.

"This example, which is largely typical, illustrates the cause of a situation which was widespread throughout the country. As a result of the rapid extension of railway lines into undeveloped and partly developed regions, numberous additions and changes were subsequently needed to bring the railway plant into adjustment with the economic development of the country. Up to the close of the last century comparatively little progress in this work had been made. Not only that, but little attention had been given up to that time to the development of refinements and economies in railway operation. These problems were left for the railway engineers of the Twentieth Century.

"That the railroads, largely through the skill of their engineers, have met and mastered these problems is attested by the excellent physical condition in which we find them today and by their success in meeting the transportation needs of the country. There has never been a time when the railroads functioned as smooth-



B. R. LEFFLER

ly and as efficiently as they are functioning today, never a time when they were so fully prepared to satisfy our country's requirements for their services.

"Since 1900 the population of the United States has increased approximately 57 per cent. In the same period the mileage of all railway track has increased more than 62 per cent. This is only one of the ways in which the railroads have grown. They have been making substantial progress in many other ways, as every railway engineer knows. They have added to their efficiency and capacity by installing block signals, by strengthening bridges, by rearranging and reconstructing yard and terminal facilities, by installing more powerful locomotives and more capacious cars, and so on. The revision of grades and alignments, the installation of heavier rail and other improvements have made it possible to operate longer and heavier trains on faster schedules and have speeded up railway operation in many other ways. The application of scientific engineering principles is chiefly responsible for increased railway efficiency.

"These developments in railway efficiency have enabled the railroads to benefit their patrons not only by keeping pace with but by forging ahead of the expanding volume of traffic: they have benefited railway employes by enabling them to earn and to receive increases in pay, and last, but not least, the prudence of the investment represented in these developments has enabled the railway owner to keep his head above water while battling the contending tides of reduced rates and increased operating expenses.

"Although railway investment has more than doubled during the life of our association, the investment in 1926 amounted to less than five cents for each unit of service performed that year, as against an investment of about six and one-half cents for each unit of service performed in 1900. If the ratio of 1900 had been maintained in 1926, the amount of service performed in the latter year would have required an investment nearly seven billion dollars in excess of that actually recorded, and the problem of attempting to earn a return on the investment would have been considerably complicated. In view of the fact that the bulk of the extra investment would undoubtedly have been made through the issuance of bonds, bankruptcy would have been a whole lot nearer under those circumstances in 1926 than it actually was.

"The years immediately ahead of us ought to see great strides in railway improvements. The public is increasingly aware of its vital interest in having good railroad service and of the intimate relationship between good service and the ability of the railroads to obtain money for continued expansion and improvement of their facilities. It is constantly becoming more generally appreciated that the expenditure of large sums of money for grade and alignment revisions, more efficient equipment, and similar projects resulting in better service for the public

cannot be expected from impoverished railroads. The trend of public sentiment is definitely in favor of encouraging railway progress by favoring railway prosperity. This constructive attitude on the part of the public promises well for the ability of the railroads to finance their improvement programs, so I believe that we are at the threshold of an era rich in opportunities for brilliant achievements in railway engineering."

During the banquet D. J. Brumley, the retiring president of the association, was presented a silver loving cup in appreciation of his services to the association. President-elect W. D. Faucette was presented a banjo clock by the members of the committee on uniform general contract forms in appreciation of their long association with him on this committee. (Our artist didn't know what a banjo clock looked like so we just handed him the gavel in our sketch.)

It would be highly improper to close this article without referring to the tremendous amount of work being carried on by this association. There are now 24 standing and four special committees with a total committee membership of

715. The reports of these committees, this year, occupy 880 pages of rather small type. The total membership of the association is now 2,607.

D. J. Brumley, the president, in his opening address to the convention, said:

"Among the major subjects under investigation by the working committees is the development of a device for the detection of transverse fissures in steel rails. Detection of such rails by visual inspection was laborious, slow and uncertain unless the radial growth from the nucleus had extended to the contour of the rail section. The magnetic testing device originated by the bureau of standards, after exhaustive tests by two railroad companies and a steel company, was abandoned. The rail committee has been working for two years with the Sperry Development Co. to perfect a device which employs the principle of air gap resistance to the flow of electrical current to disclose the location and extent of transverse fissures. The laboratory tests having demonstrated the feasibility and practical working of the device, authority was obtained from the American Railway Association to expend $23,306 on the development and building of a transverse fissure detector car. That unit is built and is now on the lines of the New York Central, undergoing preliminary tests and adjustment before final acceptance by the rail committee. A schedule for the lease of the car, at a stipulated daily rental, to a number of railroads, has been prepared by the rail committee, the idea being to demonstrate the use of the device in widely separated sections of the country. However, to make an inspection of all the rails in the main tracks on the North American continent will require the use of many machines, the number depending upon the frequency with which such inspections are made."

Officers elected for the ensuing year are as follows:

President, W. D. Faucette, chief engineer, Seaboard Air Line.

First vice president, Louis Yager, assistant chief engineer, Northern Pacific.

Second vice president, G. D. Brooke, general manager, Chesapeake & Ohio.

Treasurer, F. J. Stimson, assistant chief engineer maintenance of way, Pennsylvania, Western Region.

Secretary, E. H. Fritch, A. R. E. A.

Directors: A. N Talbot, professor of municipal and sanitary engineering, University of Illinois; Hadley Baldwin, chief engineer, Cleveland, Cincinnati, Chicago & St. Louis; and F. E. Morrow, assistant chief engineer, Chicago & Western Indiana.

Mr. Faucette, the new president, is a real Southerner, born at Halifax, N. C., educated at North Carolina State College, and for 27 years connected with the Seaboard Air Line. He is an excellent public speaker, a good conversationalist and a good listener when something worth hearing is being said. He has served the engineers' association faithfully for many years, advancing to the presidency along the customary well-worn way. For six years he has been chairman of the committee on uniform general contract forms.

One of the very important subjects treated in committee reports had to do with grade crossings. In part this report said:

"While recent reports of the Interstate Commerce Commission show a reduction in the number of grade-crossing accidents and fatalities, there are still many accidents at crossings due largely to carelessness on the part of drivers. The number of accidents at protected crossings indicates the public is not taking advantage as fully as it should of the additional protection afforded.

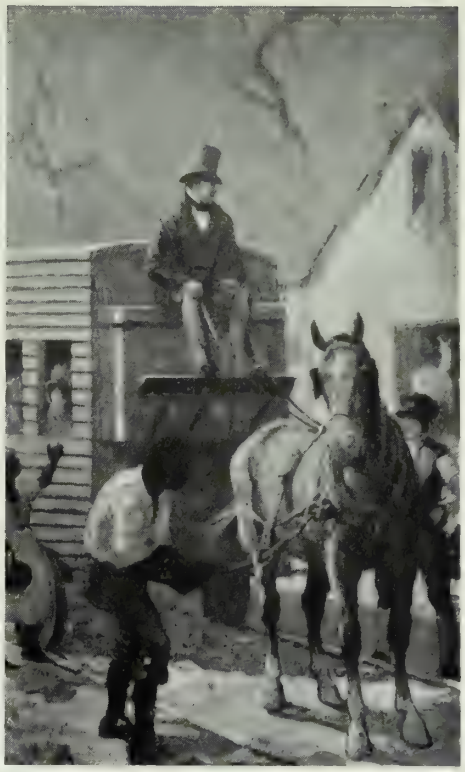
"Every grade crossing constitutes a condition dangerous to traffic. Accidents are not confined to crossings with bad approaches or poor visibility. Experience has shown that they frequently occur where approaches are good. Lack of caution in crossing seemingly offsets other advantages."

Eastbourne Corpn. autobus service of England has announced that during the past year it broke passengers and earning a net pro- all records by carrying 11,500,000 fit of $23,715.

From Now to 1977 in Engineering

A Forecast in Progress

By Samuel Rea



Engineering Has Done Much Since This First Passenger Train Started From Baltimore 100 Years Ago.

THERE were very few practical uses for electricity in 1877. Perhaps electroplating was the most important, if not the sole, commercial process in which electricity was utilized to any extent. The telegraph was in operation, but otherwise the development of electricity as a great public utility, or as a necessity in every household, was scarcely dreamed of. The telephone had been invented in primitive form, but except to a very few unusual minds it must have appeared little more than a scientific toy.

Iron and steel production were on a basis which would be considered crude and inefficient today, while the many special alloys which have made possible a new chapter in machinery production and design were totally unknown. The automobile was not only nonexistent, but not even imagined. Flying, although one of the oldest ambitions of mankind, was apparently as far from realization in 1877 as it was when the experiments of the ancients, real or legendary, came to naught. Practically the whole of present-day chemistry and all but the elementary parts of physics are new developments of the last 50 years or less.

It is my own guess some of the most notable achievements of engineering in the next 50 years, perhaps overshadowing all others in importance, will have to do with the conservation of our natural resources, particularly in the direction of eliminating waste in the use of fuels, and in recovering and utilizing more completely the by-products of distillation and combustion.

We are all familiar with the predictions and estimates that our supplies of oil and anthracite are doomed to exhaustion in a few decades. If this is so, where shall we stand in 1977 for these fuels? We believe we have bituminous coal in sight for several centuries, but we need more than this, and every effort of the country's best engineering minds is needed to restrict the waste of our valuable heat and power producing commodities.

Sometime in the future, perhaps by 1977, if not earlier, we may conceive that all small and inefficient plants will be closed and heat and power be obtained from central plants where production costs are at a minimum. Certainly this is both possible and practicable in cities and even in closely settled suburban or country districts.

The utilization of fuels is a specialized branch of engineering. Fuels are destined to become so valuable to the human race as a whole that they will be placed only in the hands of those who can to the greatest advantage control their combustion. Scarcely anything is more archaic in our civilization, or more wasteful in the eyes of the economist, than our individual househeating systems, in which all but a small fraction of the potential heat of the fuel is dissipated upon the outside atmosphere.

The gas business, as a public utility, will supply practically all heat distribution in urban localities. As capital cheapens, it will become possible to construct distributing systems supplying cheaply produced gas for house heating purposes as well as cooking. Industries in many cases similarly will be supplied with gas for fuel instead of burning coal in individual furnaces under boilers. We may then realize the smokeless city, and added sunlight will greatly improve the health of urban dwellers.

Hand in hand with the extension of gas will, of course, go the increased utilization of electricity and this will be of particular importance in the rural districts where the introduction of gas necessarily will be at a slower rate than in settled communities. The harnessing of our rivers by 1977 doubtless will have progressed a considerable way toward utilization of their potenial horsepower. We

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Mr. Rea was asked by the Engineers' Club of Philadelphia to discuss the probabilities in engineering in the next 50 years. This article contains excerpts from his address. Such speculation, Mr. Rea declared, "is an extremely hazardous diversion which men of sound judgment seldom permit themselves, and then only with reserve and caution." Mr. Rea, as most persons know, is a director and retired president of the Pennsylvania Railroad.

may also expect to see, in highly developed form, vast power distributing plants situated near our coal mines, effecting a tremendous saving in demands upon our transportation resources, which will be required for other purposes. Inter-connection of power lines to distribute loads and diversify sources of supply has almost unlimited possibilities, and the more nearly we can balance the load the more efficient will be the production and distribution of electric power.

Electricity for house heating, I think, will not develop materially except in a very few localities where exceptional circumstances make the production of power abnormally cheap. For general purposes, gas will be the more efficient and economical source.

Where coal is directly used for industrial fuel, we may expect to see it applied chiefly, if not entirely, in pulverized form, sprayed pneumatically into the fire box. Increasing quantities, however, will be subjected to the process of gas production, so that the products of destructive distillation may be recovered for laboratory purposes, and make possible the further extension of our synthetic chemistry. By 1977 the reactionary properties of practically all the elements will be known, and the chemist will be able to produce artificially, at will, a vastly increased number of substances useful in every art.

Let me hasten to add, though, that I see no reason for anticipating synthetic foods in 1977, or at any other time. That will not be necessary, for the simple reason that engineering science and methods will increase the productivity of agriculture immensely, advancing both the output per acre and the output per man-hour of labor.

Passenger Trains Nowadays Symbolize Power, Comfort, Convenience, Luxury and Speed.

In this connection, we must bear in mind that as agricultural methods improve, the proportion of the population necessary to carry on agricultural pursuits will decrease. The market for food products differs fundamentally from the market for industrial products. Consumption of the latter may be increased almost indefinitely as the purchasing power of the country and its citizens grows. Consumption of foods, however, is limited by nature and the appetite, and does not grow with increased individual purchasing power after a nation has advanced beyond the primitive stage in which famines or food shortages are still possible.

Hence one of the real problems of the future will be to absorb a surplus agricultural population which must be helped to find its way into industrial or commercial pursuits. In no other manner can we escape the menace of overproduction in agriculture, with its destructive effect upon the markets and the impoverishment of the farming population.

I do not mean to infer that we should put the brakes on progress in agricultural methods and machinery, even temporarily. That would be as foolish and wasteful as the misguided efforts of some well meaning people two or three generations ago to curb the introduction of labor saving devices in industry as a supposed measure for protecting employment. What I do mean is that putting agriculture on a scientific production basis is going to create some real problems which must be recognized and solved, and which it would be disastrous to ignore.

In the time at my disposal, it would be impossible to mention all of the many headings under which the topic assigned to me might be discussed. Many must be passed by entirely. Transportation, however, by reason of its fundamental importance and the fact that practically my entire working life has been devoted to it, is due to receive attention.

Briefly, my views are that 50 years from now the railroads will still be performing the bulk of our transportation service, particularly in freight. The movement of all commodities will increase tremendously, due to the decentralization of industry and population as well as the enormous increase in the buying power of the nation. Just

how great an increase of freight movement is likely, in mathematical terms, it would be foolish for anyone to attempt even to guess; but it will be very large.

Besides railroads, we shall have water transport, highway transport and transport in the air, as at present.

With reference to water transport, I can say frankly I see no future worth speaking of for inland canals or the canalization of rivers not naturally navigable, at least in a country such as ours, and with such waterways open only a part of the year. The expenditure of further money for projects of this character is, to my mind, in the great majority of cases, nearly a one hundred per cent waste, and I do not think the situation will be any different in 1977 from the present. As a matter of fact, the inland canal era in this country ended at least 50 years ago.

Water transport on the seas and in harbors, rivers and lakes naturally navigable may be regarded as one of the permanent institutions of the human race, and it will have progressive development in the next 50 years just as it has had in the last fifty. Airplanes will be regularly flying across the ocean, it is true, but steamer traffic, passenger and freight, will have an immense increase, and will play one of the leading parts in uniting the peoples of the globe.

The development of highway transport by motor vehicle has been the most remarkable feature of the Twentieth Century, just as the development of rail transport was the controlling factor in human progress during the Nineteenth Century. The automobile has brought with it an immeasurable amount of good, also much that we cannot yet definitely appraise. Certainly it has made us the most restless and mobile people in history, possessed by what seems almost like an obsession to be continually going to and fro. That feature may perhaps diminish in prominence in the future, if we may judge by our experience on a much smaller scale with the bicycle; but the utilitarian aspects of motor transport are on a long up-grade of which no man yet sees the end.

Note the Orderly Luxuriousness of This Modern Diner, the Railroad's Contribution to the Cause of Pleasant Public Relations.

Painting for B & O Centennial

See the Black Boy Beating the Brass As the Quaint-Looking Passengers Rush to the Dining Room From This Early Day Train.

By 1977, or before, many highway problems will have to be dealt with. This will mean, among other things, double decking streets, or perhaps even triple decking them, in the cities, with separate levels for pedestrians; one-way roads in rural districts; separation of grades where important highways cross. It is to be hoped also that some methods will be found to deal far more effectively than at present with the really appalling problem of recklessness in the use of motor cars by inexperienced or incompetent drivers.

In their relations to railroads, the most important function of motor vehicles doubtless will be to act as collectors and distributors at terminals, inter-terminal hauls being more efficiently performed by rail. Motors doubtless will absorb in the future a greater proportion of the shorter distance passenger traffic than at the present time. In the freight field their economic utility always will be more circumscribed, except for collecting and distributing purposes in terminal zones, and for reasonable distances around towns and cities. In the great majority of cases, comparatively long hauls of freight, in any considerable quantity, must in the nature of things be better and more economically performed by rail.

In air transport we may expect the future to bring developments appealing powerfully to the imagination, and practically useful as well. But anyone who expects to see airplanes supplant railroads as the principal means of passenger travel, is in my opinion making a very wild guess. Many fac-

After Dinner A Quiet Smoke in the Lounge Car, or A Game of Cards. The Man in Spats Doubtless Is A Traffic Solicitor, Passenger Department.

tors such, for instance, as the strength of materials must, necessarily, always limit the size of airplanes and keep the number of passengers possible to be transported in one machine down to a comparatively small number. Therefore, my expectation is that air transport will evolve a deluxe high-speed passenger service with genuine, but distinctly limited, utility for long distance travel and special requirements, and at necessarily high rates. I do not think it can possibly be a factor of any moment in freight service, though doubtless it will develop a field in express service for light articles, at high charges. In fact a beginning is already being made in this respect.

Insofar as the railroads themselves are concerned, the progress of the next 50 years seems likely to be more a matter of orderly development than of radical change. This is not surprising in view of the fact that railroads today represent the evolution of a full century of cumulative knowledge and experience. In the way of further improvements and betterments along lines already understood, however, there are almost unlimited possibilities, and the question how far we shall be able to go in giving the country better railroads in the next half century is chiefly a question of what the railroads will be allowed to earn.

Electrification will be greatly extended, although it is extremely doubtful whether it is at any time destined to supersede steam entirely as the principal motive power. Electricity has great operating advantages under certain conditions, such as in dense traffic, on lines with heavy grades and where frequent stops have to be made, as in commutation passenger service. It lessens terminal congestion by simplifying train movements. It eliminates smoke, which is a matter of importance to cities, and it makes travel cleaner and more comfortable. If the railroads are allowed sufficient earnings they can go very far in 50 years, or even a much shorter period, in making it possible for the public to enjoy these advantages in very large measure. If earning power is unduly restricted, progress will be correspondingly hampered.

The opinion of our best motive power experts is that 50 years hence the steam locomotive will still be with us and doing a considerable part of railroad work; for, contrary to popular opinion, steam has for many purposes operating advantages over electricity which, as far as we can now foretell, it will continue to retain. That the steam locomotive will continue to be improved, there is no question. One of the promising fields appears to be in higher boiler pressures and the more efficient use of fuel. Whether coal in powdered form will prove as successful in locomotives as in steamships and in large power plants is still a matter of experimentation.

Our rail lines themselves are capable of great improvement with respect to elimination of grades and curves and shortening of routes. This of course means more bridges, tunnels, cuts and fills, all of which cost a great deal of money. Other betterments which should be carried far in the next half century include additional double and multiple tracking; the universal use of block signals of, perhaps, improved type; the perfecting and general adoption of train control or cab signal devices, the building of new lines around congested centres to expedite through traffic.

How far the railroads will be able to go in these directions in the next half century depends more upon net earnings than any other factor. In other words, it is a question of allowing the railroads again to earn not merely bare carrying charges on capital, but a substantial surplus over, which can be utilized for the basis of credit,

You Can Get A Hair-Cut Too, and A Bath While Traveling—Engineering of A High Order. For Obvious Reasons the Bath Isn't Shown Here.

or directly put back into the property as was the general custom with prosperous, well-managed railroads thirty or forty years and more ago.

Other major problems in which engineering may be expected to make great advances in the next half century center largely about the vast increase in population which will take place by that time. Merely to cite a few, we may mention water supply, which will be inter-connected and coordinated for large areas, sewage disposal, with recovery of valuable fertilizers; flood control, which may be intimately associated with water power development; forestry, and reforestation; prevention of soil erosion, and loss of fertility; preservation of park and recreational areas; perfecting of city transit systems.

Much of this comes under the heading of what is usually termed regional planning, and which is certainly destined to play a leading role in the future progress of our civilization. It is being vigorously pushed now, and to obvious advantage, in certain sections of the country, and must be carried very much further if we are to avoid chaotic conditions.

Regional planning may be defined as the devotion of engineering science and art to the problems involved in the common occupancy of the land, which is now practically all opened up to immediate or potential use through modern transportation. It should be one of the most alluring fields for the engineers of the coming generation.

In conclusion — for these speculations must be brought to a termination as they would never end themselves—I should like to express the conviction that in 1977 the engineer and the engineering profession will occupy a position of far greater influence and importance in our social and political life than ever has been the case in the past. We are living in a scientific age and the business of the engineer is to apply the progress and discoveries of science to the affairs of every-day existence. If this is a marked characteristic of our civilization today, it will be still more marked 50 years hence, and engineering may well come into its own, with full recognition as constituting perhaps the most important of all occupations by which the human race participates in the shaping of its own destiny.

And the Tailor Will Press Your Suit While You Sleep and Have It At Your Berth in the Morning. Quite a Change From the Days of 1830.

If You Lack the Price for the Dining Car the Waiter Will Serve You in Your Seat on Some of the Principal Lines With Food Hot and Appetizing.

Keep a Little List

It is wholly consistent for congress and state legislatures to enact laws relating to railroad regulation respecting rates and service, but when it comes to the detail of railway operation, that is something which should be left to the management. This refers particularly to legislation concerning number of men in a train crew, pilots on light engines, number of cars in a freight train and similar matters which have to do only with economy of operation, and in no way concern safety of employes or the public.

The public is constantly seeking lower rates, and at the same time remains passive while legislatures are passing full crew laws and similar laws which compel the employment of more men than needed and which increase operating costs and rates.

The labor lobbyists, for the purpose of intimidation, keep a record of those who vote for and against their bills, and do not hesitate to warn those who refuse to take their program, of the consequences at the next election.

The public should give closer attention to the conduct of its public servants and when it finds a legislator bidding for any class vote by betraying the public welfare, it should at future elections effectively express its disapproval.

If the public will do this, there will be fewer demagogues in our legislatures, and more real constructive purpose in our legislation.

—Warrenton (Va.) Democrat.

With Danger Ahead the Block Signals Show Red Which Automatically Raises the White Arm in Foreground (left) to Vertical Position. Center Photo Shows How Trip Arm and Air Shut-off Valve on Car Will Make Contact if Motorman Fails to Observe Red Signal. On the Right S. R. Florence, Signal Engineer, Pacific Electric, Points Out the Mechanical Functions of the Two Units Which Bring the Car or Train to a Stop.

Subway Automatic Train Stops

Automatic train stops were placed in service March 1 in the Glendale-Hollywood-San Fernando subway of the Pacific Electric Ry. in Los Angeles. In preliminary trial tests made the new device fulfilled in every instance its functions under various speeds and conditions.

Already equipped with the most modern block signal system, the frequency and nature of the service through this long subway dictated the wisdom and necessity of providing against possible human failure. With the new device now in service should a motorman, through lack of attention to duty or any other cause, fail to observe a red signal the train will be brought to a full stop automatically before reaching a danger point ahead. It is not now possible to provide a greater degree of safety than the provisions that have been incorporated in this subway.

The operation of the new device is simple. The system consists of a stop-cock in the air line at each opposite end of the car. With a signal showing red a trip arm, installed in the track, is raised automatically to a vertical position. Should the motorman, for any cause, fail to observe the signal and bring his car to a stop, the vertical arm comes in contact with a stop cock in the air line of the car, which applies the air and stops the car.

The equipment employed required the installation of devices on 210 cars operating through the subway and at each of the 13 block signal standards. The combined cost of safety apparatus now employed in the subway represents an investment of $75,000.

The type of equipment selected has been in successful use on eastern elevated and subway lines and was approved by engineers of the California State Railroad commission.

Here's A Fine Precedent

The supreme court of Georgia has upheld an award of $6,260 made to J. M. Gary, former engineer of the Central of Georgia, in a case appealed to the court from the Richmond superior court. Gary contended he had a contract with the railroad and that he could not be discharged by the road until he had been given a "fair and impartial trial." The railroad sought to discharge him because he had incurred 90 demerits for alleged infractions of the company's rules. The supreme court reversed the judgment of the lower court in holding that the contract was binding until it was shown that the "fair and impartial trial" had been given the plaintiff.

Watch Your Step

Mrs. Emma Pitner and husband, W. H. Pitner, brought suit in Georgia to recover $3,000 from the Southern Railway company as damages for an alleged injury sustained by Mrs. Pitner in 1925, when she was said to have lacerated her left hand in attempting to board a Southern train at Cohutta, Ga.

It was charged that the plaintiff slipped and fell upon a car step "wet and slick with oil or water," her left hand striking a "sharp and jagged" trap-door catch and receiving a three-inch gash. The injured member later became deadened and "absolutely useless," it was alleged. The railroad was sued for negligence in allowing the train steps to become "wet and slick" and in failing to have someone on hand to protect the plaintiff from falling.

The high court in its decision said the passenger, by the exercise of "ordinary care," could have observed the wet condition of the steps and have avoided slipping and injury.

Station of the Union Pacific at American Falls, Idaho. Stanley Underwood & Co. Were the Architects.

Railroads Find Profits in Beauty

Stations Fitting the Surroundings

By Gilbert Stanley Underwood

Consulting Architect U. P. System.

THE MONEY value of beauty in business is pretty well known to railroad men. Artists are employed now to design cars, architects to design buildings, and landscape engineers to beautify station grounds and rights of way. Special designs are being worked out for china to grace the tables of dining cars and restaurants. Individualized blankets are being woven for the railroad hotels. Indeed the railroads have gone into art as an investment, and the investment is paying dividends.

It is a curious fact, but true, that residents of a city or town form their impressions of an entire railroad system by the station and trains they see every day. For years most of the railroads have treated their passenger stations as purely utilitarian structures to serve as sifting boxes for a varied number of passengers to be moved or fed, or both, without regard to the artistic diet of the guest,—for such he is just as much as if the railroad were a hotel.

This change for better things has manifested itself in an interesting way on the Union Pacific System. Five railroads make up the system, each passing through distinctively different parts of the country. It is a part of the architect's function to blend his buildings into their environment. I do not mean this literally, since obviously he must secure beauty even in an ugly setting. What I do mean is that the architect must react to climatic conditions, to topography, to background, to historic precedent and to economy and utility.

On the Los Angeles & Salt Lake unit of the Union Pacific System the architectural developments are being designed to fol-

The Handsome Station at Black Rock, Utah, Fits Into Its Surroundings Artistically and Still With Full Attention to Daily Usefulness.

low the Spanish and the Spanish Colonial precedent. At the southern terminus of the line, the Mission architecture of the early padres serves as inspiration. It is a style expressive of Southern California; deep shadows under tiled arcades, low pitched roofs, simple, plastered walls and small windows to shade the interiors from too much sunlight. As the line moves north and east into Nevada and Utah, the climate hardens, and the architecture gradually changes from the softened contours of the Mission to the more severe silhouettes of Northern Spain and the Spanish Romanesque.

The Oregon Short Line and the Oregon-Washington Railroad & Navigation Co., both units of the great Union Pacific System have for their "parti" a style which combines the steep roofs of the English and Norman countries and the brick beltings and quoins which help to give "life" to the smaller stations on these two units. The larger cities, like Boise, are powerful enough to put the impress of their history and their environment on the architecture of their passenger stations, and this is true of nearly all of the larger cities on the system.

We have developed a similarly distinctive type on the Union Pacific Railroad for the smaller stations. In special instances stations have been designed to harmonize with the city rather than the system, as at Parco, Wyoming, where the station was designed in the general architectural style of this new city, and at Topeka, Kansas, where the station follows the classical influence of the capital city of the state.

New buildings, however fine their architectural character, are often raw and unfinished in effect through neglect of that ever necessary element in good design,—landscaping. A building must be "tied in" to its site to complete the effect of belonging. Recently the newer stations of the Union Pacific System have been embellished with studied landscape developments. Most of the photographs which illustrate this article were taken shortly after completion of the building and before planting had been started. The station at East San Pedro was built in as hopeless an environment as an architect is called upon to face. The site was flat and sandy, and surrounded by fishermen's shacks on one side and unimaginative industrial buildings on the other. The building houses a clerical force on the second floor, and this element of height was used to give the design dominance over the immediate neighborhood. A triangle of waste and useless land was well soiled and planted by a nationally known landscape architect who also arranged planting spaces around the building for foundation planting. As this article is written the East San Pedro development is a thing of real beauty, an oasis in a desert.

The Waiting Room in the Union Pacific Station at Ogden Is Spacious, Well Lighted and Thoroughly Ventilated, With Every Modern Convenience and Comfort For Travelers.

At Nampa, Idaho, the passenger station was built on a fill of several feet. At each end of the building there was left a long stretch of company property which it would have been economically unsound to fill. These two depressions were made into sunken water gardens, with pools, walks, studied compositions of trees and shrubs, and what would have been otherwise useless land was turned into beauty and advertising by the hand of the landscape architect.

In establishing a distinctive style for each of the units of the Union Pacific System, there has been no effort to keep the solution of any particular problem of design within the compass of a set formula. Each of our buildings is designed to fit its own particular setting and to perform its particular function at that point on the system.

It is interesting to note the influence of good railroad architecture on the civic pride of towns where new and artistic station buildings have been erected. The same influence finds its effect on the pride and morale of railroad employes. To a perhaps slower

degree, good station architecture reacts on adjacent property to its betterment, as at Pocatello, Idaho, where the influence of the railroad's improvement has been definitely mirrored in the character of nearby-by buildings.

This movement on the part of the larger railroad systems is accelerating. The day is not far distant when a traveler crossing the continent will find the old ugly common standard structures replaced by buildings of real character and taste, for big business has found that beauty pays dividends.

Waiting Room in the New Union Pacific Station at Boise, Idaho.

An Aerial Pilot Arrested

Garland C. Peed, pilot for Reginald Denny, motion picture star, pleaded guilty, February 14, to three counts of reckless driving in the air before Municipal Judge Bush. Motorcycle Officer R. N. Davis of University division police declared that Fred had been flying so low that he narrowly missed nipping off a rooftop here and there and had been performing acrobatics below the prescribed limit.

Officer Davis, unable to give Peed a tag at the moment, set out to track him to an airport and managed to keep him in sight until he landed, whereupon he placed the pilot under arrest. A suspended sentence of a $500 fine each on two counts and a fine of $50 on the third count were assessed against the reckless pilot.

The treaty of Versailles forbids the construction in Germany of airplanes large and powerful enough to cross the Atlantic Ocean.

Emerson says: "Good manners are made up of petty sacrifices."

Angry Motorist—"Some of you pedestrians walk along just as if you owned the streets."

Irate Pedestrian — "Yes, and some of you motorists drive around just as if you owned the car!"—Hardware Age.

The Station at East San Pedro Stands in Grounds Planned by A Nationally Known Landscape Architect. It Is An Oasis in An Industrial District Otherwise Lacking in Beauty.

Education for Railway Work

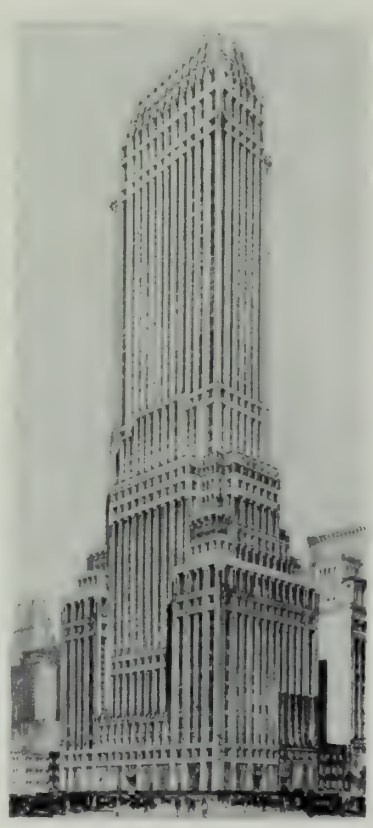
A committee of the A. S. M. E. of which H. B. Oatley is chairman reporting on work accomplished in 1927 has this to say in Mechanical Engineering on the subject of education:

"Questionnaires were sent to all the technical schools and colleges that maintain courses designed to prepare students for railway mechanical engineering work. The replies show that the various educational institutions are beginning to feel the results of a greater effort on the part of the railroads and railway supply companies to cooperate in the training of men for their respective industries. In addition, the American Railway Association has been utilizing the laboratory and test facilities afforded by the various educational institutions, especially at Purdue University.

"The Pennsylvania State College has for some time been studying the problem of insulation and heat transmission, factors in the efficient insulation and cooling of refrigerator cars and the heating of passenger cars. Considerable progress in this work has been made in the past year.

"A number of radical changes are being considered in the courses of study offered to students in railway mechanical engineering. For a number of years past different institutions have maintained courses in their curricula leading to the degree of Bachelor of Science in railway mechanical engineering. Among the most prominent have been the University of Illinois, Purdue University, Pittsburgh University, and the Pennsylvania State College. Some of these institutions abandoned the course a number of years ago and combined the railway course with the straight course in mechanical engineering, along much the same lines as the average course of study in civil engineering. Pittsburgh University, it is understood, and the Pennsylvania State College are, however, still maintaining a course in railway mechanical engineering. The latter institution, however, is seriously considering the abandonment of this course and including the more important railway subjects in its mechanical engineering course.

"In many respects this trend in railway mechanical engineering education will be beneficial from the standpoint of both the railroad and railway supply industries. It is generally felt that mechanical engineers should have as broad an education as possible, and that specialization in college is not beneficial. It is also felt that a considerable improvement can yet be had in the educational field by a more careful selection of students in mechanical engineering, the installation of some scheme of vocational guidance, and the planning of the course of study more adequately to serve the mechanical engineer in railroad work dealing with steam turbines, gas engines, electric traction, etc.



The 58-Story Chanin Office Building, New York, the First Floor of Which Is to Be A Bus Terminal for the Baltimore & Ohio Railroad.

"The outstanding development in this field of education, from the standpoint of the railroad and railway industries, is the cooperative plan in engineering and commerce instituted several years ago by the Georgia School of Technology. The original plan of cooperative education for engineers was first instituted in September, 1920, when the textile department of that institution arranged a course, to cooperate with the cotton mills, in the education of textile engineers. Since that time the cooperative plan has been extended to a number of railroads; viz., the Central of Georgia, the Tennessee Coal, Iron & Railway Co., the Georgia Railway & Power Co., the Atlanta, Birmingham & Coast, and the Nashville, Chattanooga & St. Louis. Under the cooperative plan the student spends alternately four weeks in college and four weeks in mechanical engineering work in the railroad shops at Atlanta, Ga., and the cities within a radius of about 300 miles. By this arrangement the Georgia School of Technology has available two courses in mechanical engineering: viz., the standard four year theoretical course as given by other engineering colleges, and a five year course for those students who wish to combine practical experience with technical theory. The cooperative course is under the administration of a director, an assistant, and an advisory board consisting of executives and officers of the various industrial and railroad companies with which the school cooperates.

"The research work being carried on by the railroad division's committee on professional service shows that the opportunities afforded in the railroad industry are comparable to those afforded in any other industry. In all probability there will be a larger number of mechanical engineers entering railroad work in the future."

Our Neighbor At the North the C.P.R.

By Charles Dillon

E. W. Beatty,
Chairman and President, Canadian Pacific Ry.

WHEN a man mentioned Vancouver or Saskatchewan, forty years ago, he was thought to be a much-traveled person. He had seen strange places in his journeys over the earth. Not many knew whether Kamloops was a town or a game, and Medicine Hat and Swift Current were supposed to be pretty well along on the way to the North Pole.

For the encyclopedia-travelers Vancouver was simply a name. Men who thought they were wise had picked Port Moody—not far away—for the future metropolis of the Pacific Coast, and with fairly good reason, too, because it was, officially and judicially, the point selected for the terminus of the Canadian Pacific Railway, then building across the continent.

Vancouver sneaked into the picture quite unexpectedly, as readers of history know, but once in it stayed there and held the stage—and it has done so ever since. It was a bum looking dump when the first C. P. R. train pulled in there, one day in May, 1887, and puffed up to the dinky little frame depot down on the water front—the town had been burned the previous year—and it wasn't much to brag about three years later when the present chronicler burst upon the scene. Chiefly it seemed to be there to greet world travelers from Montreal on the way to the Far East, or returning from that region on their journey back to Europe. In those days the arrival of the Empress of Japan or China or some other benighted land, the finest steamships of their time, was an event to thrill the townsfolk. After a while the railroad company built the Hotel Vancouver, and a little later the C. P. R. Opera House; Port Moody which had been only temporarily disturbed, went back to sleep, and Vancouver began building for the future.

Now look at the town! More than 250,000 population, a world port known to everyone who gets outside his own township, declared by well-informed persons to be one of the handsomest cities in the world, a great industrial, commercial and social center for Northwest America. Into its wonderful harbor come ships from every part of the globe, ships bearing strange, odoriferous cargoes that bring back memories of foreign ports, nights at sea, the odors of tea and spices and what not—a new world port with an unforgettable old-world charm.

And Kamloops, Medicine Hat, Swift Current? These and many other fine places along the way toward Winnipeg have grown into cities with the passing years, important towns with work to do in the upbuilding of the West.

If you are old enough to know the meaning of Van Horne and Shaughnessy, two valiant Ameri-

The Canadian Pacific's Fine Hotel at Toronto.

can railroaders, if ever there were any,—and telegraph operators, too, should anyone ask you,—you will be justified in feeling some pride over the success of this great transcontinental railway and world steamship company, privately owned and operated, be it remembered, and publicly very popular, an alliterative way of stating rather important facts. All of which is intended to beguile the more or less gentle reader into continuing his search for knowledge by contemplating the activities of our northern neighbor in 1927 so that we in the country farther southward may not be too deeply impressed with our own achievements.

Every writing man avoids superlatives, they so seldom stand up under analysis. But in this instance it seems perfectly safe to say that the outstanding accomplishment of the Canadian Pacific, last year, was the completing of the great B-C pier at Vancouver. This pier is one of the best constructed, planned and equipped on the North American continent. In fact, some overseas authorities have described it as the finest pier in the world. Unquestionably it is a most valuable asset not only to the company but to the Dominion of Canada, a very fine addition to the railway and steamship facilities of a growing city.

Other works and improvements of considerable magnitude were taken in hand and completed during 1927, but there was nothing unusual about them. They were in accordance with the company's general policy of improving its facilities from year to year to keep pace with current development and provide in a reasonable degree for the future. For example, this company, during the past year, completed the Hotel Saskatchewan in Regina. This hotel has 240 bedrooms, as well as spacious public rooms. It continued its program of improvements to the Banff Springs Hotel and surroundings, as well as the ordinary improvements and renewals to the physical condition of the railroad. Nearly 400 miles of branch lines were brought to practical completion in the prairie provinces of Manitoba, Saskatchewan and Alberta before winter set in, and 282 miles of this new construction is in present use for movement of the second largest crop on record in that territory.

The outstanding railroad feature in this Canadian territory, of course, is the movement of the grain crop during the unusually short period prior to the close of navigation, and more particularly during the crop season of 1927 on account of the late beginning of harvesting due to adverse weather conditions. The elasticity of the company's organization, adequacy of its supply of rolling stock and its system of distribution were amply demonstrated. It may be pointed out too, that during the last month prior to the cessation of shipping on the Great Lakes, the movement took place under climatic conditions of most unusual severity. One reason for this accomplishment is the company's general policy of efficient maintenance of roadbed and rolling stock. This is mentioned especially because reference has been made from time to time by various railway authorities to the low maintenance costs of the

Piers of the Canadian Pacific Steamship Company at Vancouver, B. C. Erected in 1927, and Dedicated During Canada's Diamond Jubilee in July.

Canadian Pacific as compared with those of the majority, if not all other Class I railways.

The figures in connection with the grain traffic convey a good idea of the enormous volume of grain handled by this company between August 1, the beginning of the crop year, and the middle of December, 1927. During this time there was loaded on Canadian Pacific tracks, 155,915,696 bushels, or approximately 108,923 cars. Cars of grain arriving on the lake front (Fort William—Port Arthur) over Canadian Pacific tracks from interior elevators 80,426 loads. The largest marketing day in the history of the company to date was on October 24 when 5,109,000 bushels were loaded into cars. Cars of grain delivered at Vancouver from August 1 to December 31, 10,608 loads.

For the sake of comparison the reports show that, while the movement of grain to the head of the lakes during the past season of navigation proved to be well up to the average, one of the outstanding features of the year's grain crop movement was the handling performance through the port of Vancouver, as, judging from present indications, the volume shipped will be substantially in excess of any previous year, including 1923-1924 when approximately 55,000,000 bushels were shipped through that port. Another outstanding feature was the record wheat crop produced in the Province of Alberta which amounted to approximately 199,346,000 bushels.

In the marketing of grain by the farmers in 1927 there was a marked advance as compared with previous years due in part to the

adoption of the combined harvester-thresher, and the use of the motor truck. This also has been especially noticeable in Alberta where, at the height of the season, approximately 6500 trucks were employed in hauling grain from the farms to the shipping stations. The speed with which the grain is delivered is remarkable as compared with the operation of horsedrawn vehicles. Continued improvement in highways, which is contemplated by the provincial governments, and the prosperity of the farmers in general following three good crops in succession, has placed them in possession of funds to purchase up-to-date farming machinery and trucks. There is reason to believe, too, that hazards more or less attendant in the past upon harvesting operations due to adverse weather conditions will be very much reduced in the future, thus permitting not only minimum wastage of grain during such operations but the extension of farming into districts which hitherto have been somewhat difficult on account of latitude or distance from railways.

The Prince of Wales Bridge.

In the eastern region served by the Canadian Pacific, between Fort William and the Atlantic Coast, one of the important physical accomplishments of 1927 was the completion of the Prince of Wales bridges at Ottawa. These were ready for the operation of heaviest power on January 15, or six months after the beginning of field work. The work involved the replacement of 13 through truss spans with a total length of 887 feet, the new work weighing approximately 3,200 tons. All the work of taking down the old light spans, erecting the new steel work, and the necessary changes to piers and abutments was handled without any interruption to traffic.

One hundred and eighty-one miles of new 85-pound and 100-pound section rail were laid at an average speed of 7.8 miles a day, with a maximum speed in any one day of 11.8 miles.

Two hundred and seventy-six miles of main line were rock ballasted, requiring approximately 1,200,000 tons of crushed rock, and the work was carried out at an average speed of 1.9 miles of finished track for every working day in the year.

In connection with recent flood damage in the Province of Quebec and the state of Vermont, the destruction to track, bridges and buildings distributed over about 220 miles of main line and branches involved the complete washout of approaches to 40 or more bridges varying in depth from 10 to 30 feet and, in distance from 50 to 500 feet, roadbed and ballast section was destroyed in stretches up to 1½ miles with, in places, the roadbed embankment washed out completely, and the track overturned or undermined and a number of culverts with overlying fill of 20 to 40 feet depth carried away, and an immense amount of debris consisting of portions of highway bridges, hay barns, dwellings, a creamery, thousands of trees and many thousands of tons of sand and silt deposited where the track had been. The damage is estimated at a million dollars. The reconditioning of this mileage so

Hotel Saskatchewan Owned and Operated by the Canadian Pacific Railway at Regina.

as to permit the operation of passenger trains was completed 32 days after the flood had subsided sufficiently to permit a start on the reconstruction.

Export grain moved from bay ports on the Great Lakes to Montreal during the season of navigation in 1927, River St. Lawrence, amounted to 15,616,000 bushels, and the movement of grain via the port of West Saint John during the winter months of 1925-1926 amounted to 13,584,000 bushels. For the winter of 1926-1927 there was moved through the latter port 19,781,000 bushels of grain.

Our neighbors at the North are a busy people. Certainly they are an attractive lot in a superlatively wonderful region. Tourists from the United States are spending about 250 million dollars a year up there, demonstrating in a most satisfactory way that the steady increase in the popularity of Canada as a summer and winter resort, is producing a substantial revenue for the hotels, railroads, and shops catering to this trade. All the towns near the border have come to appreciate the importance of this movement and are providing better accommodations and more attractive amusements for visitors. This winter for example, both Montreal and Quebec arranged special winter festivals, and thousands of visitors went over to see and enjoy tobogganing, snowshoeing, ski-ing and skating. While the number of visitors who went there for the special festivities was very large, there is also an increasing number who spend week ends and holidays in Canada at various times during the winter. And, in the words of a popular advertisement, surely such popularity must be deserved.

The Canadian Pacific's Steamship Empress of Asia, Entering the Harbor at Vancouver, B. C.

Part of the Water Front Showing C. P. R. Docks at Vancouver. Pacific Airways Photo.

Street Cars to Disappear

John J. Dempsey, who for nineteen years was vice president in charge of operations of the Brooklyn Rapid Transit Railway of New York and who now is an independent oil operator of Oklahoma, said a few days ago:

"I believe that street railways are to become less and less important as common carriers and that most of the business is to be done by motor buses in the future. City planning and development of arteries should be considered with that end in view, for it is bound to come."

Those "Low" Canadian Rates, And Why

Speaking recently before the convention of the Southwestern Iowa Retail Lumbermen at Council Bluffs, C. D. Morris, representing the western railway presidents in public relations work, said it is natural for shippers to desire the lowest possible rates on their particular commodities. "It is well to remember, however," said Mr. Morris, "that rates cannot be made to suit the individual desire of every shipper. To undertake such a feat would mean the early bankruptcy of every railroad in the country.

"Just now the Interstate Commerce Commission is holding hearings in different sections of the country, under the authority of the Hoch-Smith Resolution passed by congress more than two years ago, with a view to determining whether further reductions in the rates on agricultural products can be made. The essence of this resolution is to lower freight rates for the benefit of an industry at times when the business of that industry is unprofitable. The purpose was, ostensibly, to benefit the American farmer, but, carried to its ultimate conclusion, this resolution is more likely to injure the very industry it is designed to benefit, for of all shippers the farmer can least afford an impairment of transportation service.

"It has been said repeatedly that rates on grain, in certain sections of Canada, are lower than from our western grain fields, and a western senator has introduced a resolution providing the rates on American grain be reduced to such an extent that they will not be higher than those said to be charged in certain sections of Canada. It it generally known that the rates on grain and grain products charged by Canadian roads were established in recognition of certain subsidies granted them by the dominion government. In a decision given February 8, 1927, the Interstate Commerce Commission said, 'It is shown of record that the Dominion of Canada aided in the construction of the Canadian Pacific by giving that company 25 million dollars in cash, 25 million acres of land, a monopoly of traffic in certain territory for 20 years and perpetual exemption from taxation by the dominion government or any province thereof established after 1881'. When the road was completed the country through which it passed was without population and a low rate on grain was established in order to encourage immigration, the purpose being to develop the country. A little later, as part compensation for further cash subsidies and land grants, the road entered into what is known as the 'Crow's Nest Pass Agreement', the Canadian Pacific reduced the rate on grain from all its stations to Fort Williams three cents a hundred pounds, and, under the terms of that agreement, these rates were to be made perpetual.

"In 1924, in considering the rates established by the 'Crow's Nest Pass Agreement', the Canadian commission found that while the rates in existence had been considered fair and reasonable when established they now represent only 35 to 60 per cent of rates found adequate under existing traffic conditions. The demand now being made for equalizing the rates between the two countries is, therefore, made despite the fact that the Canadian rates were established in return for special favors granted by the government, which government now admits these rates are inadequate and unfair.

"But, removing entirely the question of subsidies granted the Canadian roads from consideration, there is another reason, and a very forceful one at that, why our western railroads cannot stand a reduction in their grain rates to the level charged in certain parts of Canada. In 1921-1925 inclusive the taxes paid by western railroads averaged $1,065.44 a mile annually, while those paid by the Canadian roads averaged $227.98 a mile. This is a difference of $837.46 a mile. Indeed, our western roads, during the five year period 1921-1925 inclusive paid $111,313,642 more taxes than they would have paid had their rates by the mile been the same as those of the Canadian roads during the same period. Based on the traffic of 1924, if we would but reduce the taxes of our western roads to the same figure paid by Canadian roads, they could not only reduce their rates on grain, but on all agricultural products, 20 per cent, and still save over five million dollars a year by the transaction.

"There is another condition with respect to Canadian roads that ought not to be overlooked. During the years from 1921-1925 inclusive the dominion government paid an annual average deficit for the Canadian National Railways of $55,165,908. This was an average deficit by the mile of road operated by the Canadian government of $2,596. If our western railroads were to receive the same consideration from the United States government as the Canadian National Railways in the way of payment of interest on bonds and guaranteed dividends on stocks, amounting to an average of $2,596 a mile, and reduce their taxes to the same rate by the mile paid by Canadian roads, it would mean to the Class I railroads of the western district an added net income, or an equivalent saving of $456,369,185. This would permit a 25 per cent reduction of their total freight revenues and leave the roads a net income of millions of dollars in excess of what they now enjoy. Indeed, were this done our western railroads could carry all products of agriculture, except mill products, and including livestock free of charge and still be better off at the end of the year, by several million dollars, than they now are."

Passengers Turn From Trains to Buses

Railways Show Big Reduction

By Ralph Budd

President Great Northern Ry.

WE HAVE become so accustomed to the ever-increasing commercial and industrial activity in the United States that our appraisal of business conditions, at the end of a year, as good, fair, or excellent, is generally based upon comparison with the increases in other years. It therefore comes as a distinct shock to hear of a substantial and continuing decrease, especially in an old established line of business.

Such a decrease is that in railway passenger traffic since 1920. In that year approximately 1,270,000,000 passengers were carried on the railways of the United States. In 1927 the number had declined to about 849,000,000, a decrease of 33 per cent. During those seven years the population of the United States increased approximately 13 per cent.

As any business declines, it becomes necessary to reduce expenses. When freight traffic declines, fewer freight trains are run as a matter of course, but taking off passenger trains is not a simple matter, and so we find that with only two-thirds as many passengers in 1927 as in 1920, the railways made about 99 per cent as many passenger train miles. The loss of passenger traffic has been more severe on the western roads than in the East, the number of passengers handled in the western district being only about one-half as large in 1927 as in 1920. To localize still further, in Minnesota the railways handled about one-third as many passengers in 1927 as they did in 1920 and made about 92 per cent as many passenger train miles, while the population of Minnesota increased about 15 per cent during that period.

The reduction in train miles has been offset by the heavier passenger cars now in use, so there probably has been no reduction in ton miles of passenger train service. It is therefore a fact, entitled to very serious consideration, that the falling off in railway passenger revenue means almost an equivalent reduction in net income, which must be made up out of freight and longhaul passenger earnings. A reduction in passenger train miles would, of course, reduce the net loss.

There probably never has been a seven year period when the total amount of traveling done in the United States increased so much as it has since 1920, and this has been true in the West and Northwest, as well as elsewhere. The loss in railway passenger business merely represents a change in mode of travel by the public. The railway continues to be supreme in long-haul passenger traffic, just as it is in freight traffic, and it is difficult for me to believe that the through passenger business of the railways will not continue to increase with the growing population and wealth in this country of great distances. Except in and out of the largest cities, however, there is no doubt about frequent trips by small transportation units suiting the local traveler. The gas-electric rail motor car, which is being used quite extensively by railways, is a step in response to that requirement; the highway motor bus is a further move in the same direction; the private automobile, of course, the ultimate in local travel. There are about 20,600,000 automobiles in this country. Practically all of them are carrying passengers every day. In the aggregate, they are handling many times more people than the railways did during their busiest days of 1919 and 1920.

The private automobile is responsible for railway passenger revenue being $300,000,000 less in 1927 than in 1920. The convenience of highway travel is responsible for the motor bus, which, in its best development, affords flexibility as to route, schedules, and service, as well as riding comforts comparable with the automobile, and at a cost comparable with railroad fare. Seeing these advantages, a great many small operators began a few years ago to run buses, with the result that there was, and in many localities there still is, an excessive number

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An address before the Society of Automotive Engineers, New York.

of buses on the highways; while the railways, on tracks parallel with the highways, are continuing to maintain approximately their former schedules. As the public finally must pay for all such transportation, it clearly was and is in the public interest to eliminate the wasteful duplication. The ideal arrangement would seem to be the substitution of correlated bus and train schedules for the several competing buses and trains.

Summer travel from the middle and lower sections of the Mississippi Valley to the hundreds of lake resorts of Minnesota illustrates how a bus system may serve as a connection for railway lines. Six railways bring passengers from the south to the Twin Cities, whence bus lines radiate to all parts of Minnesota, reaching the lakes directly and with frequent service. A combination rail and bus haul thus offers the quickest, cheapest, and most economical way for thousands of tourists to visit the Lake Park Region of Minnesota, and by using the connecting bus lines and explaining the advantages to their patrons the railways are able to win an important passenger movement that otherwise would go by private automobile.

In some cases the best results may be obtained by having the railway operate the buses as well as the trains. I consider regulation of the carriers of commerce on the highways as well as of those on the railways a prerequisite to such an arrangement. The various states now have pretty complete bus regulation within their borders, but the matter of federal regulation is a live issue. The majority of bus operators recognize the necessity for some federal legislation to provide for such regulation, but question the extent to which federal should supersede state authority.

Intrastate commerce comprises such a large part, approximately 90 per cent of the total commerce carried by motor buses, that their regulation should be left to the state authorities as far as possible. The problems for the most part will be local problems, even though companies may operate across as well as within state boundaries. The requirement of a certificate of necessity and convenience for interstate operation really seems to be the only pressing necessity for any federal legislation. The first question to determine is whether highway buses are desirable. If they are, care should be taken in outlining regulation of them, not to strangle the industry instead of protecting it; and the industry should be allowed to develop and become reasonably stable before too much is attempted in the way of detailed regulation. How all this can best be done involves legal and practical questions of such intricate nature that I can do no more than to indicate, as I have, the result which should be sought.

Motor Coaches, Nowdays, Probably Are More Alluring Than Any Other Vehicle For Travelers of Every Kind.

Taxation is closely related to regulation, especially since regulation includes the fixing of rates and fares. There is no uniformity in the motor vehicle tax plan of the various states, but most states have adopted the idea that motor vehicle and gas taxes should go for highway construction and upkeep, if they do not indeed provide the entire fund. The tax on gasoline in this way has come to be almost universal.

Those who choose to make use of the public highways by riding in commercial vehicles may well insist that they are entitled to the best service and the lowest fares the companies can give, and that taxes beyond what would be fair and equitable, considering the use of the highways by these vehicles, place an unfair burden upon the riders, either by requiring a higher fare or by depriving them of a frequency or quality of service that otherwise would be available to them.

Taxation and regulation are separate functions; the former should be based on the proportion the use of the bus bears to the total use of the highways, and the latter should cover rates, schedules, and safety for passengers, as well as such things as size, weight, and speed of the bus, to insure proper use of the highways and protection of other vehicles using them.

It seems to me the public would get the most for its money if all regulation of all carriers of commerce would leave the managers of the transportation agencies as free as possible in their operation. Individual initiative is so desirable that it should be encouraged, especially during the development period of this new form of public transportation. Restrictions which prevent a substantial amount of experimenting will delay and may preclude ultimate attainment.

There is no question that the motor bus will become a more important factor in local passenger traffic, and that the motor transport business will be a permanent and substantial institution if there

is accorded to it a recognized, definite, and stable public policy based on fair and reasonable regulation and taxation. Granting such treatment at the hands of regulatory bodies, the future of the motor bus industry in large measure will be what the operators make it. Among the marks to aim for, the most important are greater travel comfort for passengers and lower cost of operation.

As to economy, reliability, speed, and riding qualities, it is only fair to say that there has been phenomenal improvement, beginning with the use about three years ago of vehicles built for passenger business instead of the modified trucks that previously had been used. I think these great improvements in the vehicles themselves are largely responsible for the growing popularity of buses, as evidenced by the fact that there are now 90,000 of them in use in the United States. Most operators whom I know think that intercity buses generally are underpowered, and that great improvements may be expected from designers who will attempt to bring bus motors up to the high state of development that has been reached by motors used in airplanes and private automobiles. More power with lower motor speeds will tend to increase the life of the motor, insure smoothness of operation with less noise, and reduce the cost of operation. It would be a great step forward if the weight of chassis frames and bodies could be substantially reduced without sacrificing the necessary strength. Perhaps the use of aluminum alloys will make this feasible.

Buses and Trucks Popular

Curiously enough, motor car competition with the railroad day coach is now least active in the densely populated eastern sections of the country. In the South and the West the motor car is still increasingly used as a substitute for the day coach. In the East congestion of traffic in the streets and highways has forced many to abandon their private cars and resort once more to the trolley car or the steam railroad.

Railroads are using the motor bus and motor truck more and more as feeders where their charters permit that adaptation to new conditions. The movement toward railroad consolidation is bound to affect the motor bus and motor truck companies and to lead to coordination of the several transportation agencies.—Easton (Pa.) Express.

High Heels at Your Own Risk

"Women who wear high heels cannot complain if they fall and injure themselves," declared Justice Morrison in the supreme court at Vancouver, B. C., when he dismissed an action brought by Mrs. Theresea Roddy against the British Columbia Electric Ry. Co., seeking $7000 damages.

Mrs. Roddy said that as she was leaving a car her heel caught between the slats of the floor with the result that she was thrown heavily in the vestibule.

The high-heeled shoes she was wearing formed a court exhibit.

Two Generations of Transportation, Widely Separated, Stop on the Road for a Chat. A Contrast in the Black Hills of South Dakota.

Cutting Down the Time

By O. O. Carr

The recent shortening up of through passenger train schedules shows there is a demand for faster travel on railroads. No doubt similar improved service may be brought about by a reduction in time of some two, three and four-car local passenger train schedules subject to highway bus competition.

Speeding up of schedules may be done by making flag stops out of some regular stops, where there is not always the necessity for the stop, allow less time for work at regular stops, and require a higher rate of speed between stations.

In recent years railroads have made a campaign for "on time" performances. No doubt the tendency of those on the ground who have to produce the service, is to have an easy schedule in order to maintain and show a high per cent of trains on time. In the preparation of time tables this feature may have had too much consideration since we have the highway buses to consider.

In a recent check of time tables, a wide variance is indicated in schedules covering a number of local passenger trains on roads doing almost identical work in general rolling country, in similar populated territory, and on train districts where density of traffic is similar. A separation of these were made in totals or averages, one for those schedules 30.2 m.p.h. and over, and those 28.9 m.p.h. and less.

The distance and time over the entire train district was not, in all cases, taken into the calculation, it being the purpose to omit the distance and time where a train may be required to run for a mile or two at a restricted speed out of or into the larger cities. In other words, the stations between which the distance and time was taken in these checks cover main line territories, and between such points where there is nothing in a general way to restrict these trains running at a high rate of speed up to a point where engine shuts off steam to make stop for the ordinary small town station.

In the column "schedule speed miles per hour," it includes standing time doing station work, waiting for connections, lunch, meet and pass points, etc., as shown on time table.

Column "approximate speed miles per hour between stations" excludes an arbitrary reduction of two minutes from schedule time, each stop for stopping, work, and regaining speed again, as time lost (compared with time it would take to cover the same distance had stop not been made.) Also dead time waiting for connections, lunch, etc., as shown on time table.

For convenience in comparison of the two operations, we shall assume the miles run by the faster scheduled trains are 85.9, the same distance as the slower trains, which make 26 miles an hour, and scheduled to cover this distance in three hours and 18 minutes. The faster schedule, or 31.7 miles an hour, train would cover the 85.9 miles in two hours and 42 minutes, or 36 less locomotive minutes on the road.

In actual practice, the slower schedule trains run faster between stations than the time given them in the schedule and the slow time is really killed at the station waiting time due to leave.

Various fuel checks show that approximately 13 pounds of coal is consumed per minute by a locomotive standing, where the stop is only for a few minutes and steam pressure maintained for immediate use, whether this fuel loss is replenished while standing at station or after starting.

Thirty-six minutes longer on the road standing at station waiting for time to leave means 468 pounds more of coal at $3 a ton, including transportation costs delivered on engine. This means a loss of 70 cents plus two cents superheat oil lost, total 72 cents a trip, or $262.80 a year for a train; and if there are 15 such trains on a line, each direction, a total of 30, there would be an opportunity for an estimated fuel conservation of some $7884 a year.

The schedule speed of the faster trains ran as high as 36.9 miles an hour and the running speed between stations as high as 42.8 miles an hour, the latter figure calculated as explained.

The schedule speed of the slower trains ran as high as 28.9 miles an hour and the running speed between stations as high as 33.5 miles an hour, the latter figure calculated as explained.

Trains in each group are about equally divided between double and single track operation.

COMPARISON OF LOCAL PASSENGER TRAIN SCHEDULES

	Continuous miles checked	Cars	No. reg. stops	Avg. Mi. betw. reg. stops	Time hrs.	Time min.	Schedule speed miles per hour	Aprx. speed m.p.h. betw. stns.
Avg. faster trains	94.0	4	13.5	7.0	2	58	31.7	37.5
Avg. slower trains	85.9	4	13.7	6.2	3	18	26.0	30.9

Maybe These Will Work

The San Antonio Light makes the following suggestions either to replace or reinforce the "Stop, Look and Listen" slogans in effect at railroad crossings.

Tell a man to "Stop, Look, Listen," and he is impelled to do none of the three.

We suggest the following signs for railroad crossings:

"Come Ahead, You're Unimportant."

"Try Our Engines. They Satisfy."

"Don't Stop. Nobody Will Miss You."

"Take a Chance. You can Get Hit By a Train Only Once."

This Is the Ljunstroem Turbine Locomotive Which the European Correspondent Says Saves 50 Per Cent in Fuel and 96 Per Cent in Water Consumption. Now Used Extensively on Railroads in Great Britain and Sweden. International Newsreel.

Training for Railway Work in England

A Comprehensive Course

By Sir F. J. C. Pole

General Manager, Great Western Ry.,
Paddington Station, London

MEMBERS of the company's staff are encouraged to attend instructional classes in railway and kindred subjects at the London School of Economics (University of London) and other universities and technical colleges in towns served by the company's system, the fees being borne by the company. These classes comprise such subjects, as the following:—

- The law of carriage by railway.
- Railway statistics.
- Railway economics (operating and commercial).
- Rate-making.
- Freight station working.
- Control systems in railway working.
- Railway accounts.

Classes are also arranged in conjunction with the London County Council Evening Institutes to enable the younger members of the clerical staff to receive instruction in shorthand, typewriting, mathematics, etc.

Railway signalling and station accountancy classes are held under the company's own auspices at various centers throughout the system. Correspondence courses are also arranged in railway signalling for the benefit of staff who are unable to attend the classes.

Lecture and debating societies are encouraged and supported by the company.

A library and reading rooms are established at Paddington. The use of the library is available to the clerical staff throughout the system, the company giving facilities for the conveyance of books by their train services.

Facilities also provided for games, such as chess, draughts and billiards.

The Mechanics' Institution is at Swindon, the headquarters of the company's locomotive, passenger and freight car department, and is open to all members of the staff employed at that place. The facilities provided include lending library, reading rocms, chess, draughts, billiards.

An historical account of the institution is included in the programme of the visit of members of the International Railway Congress to Swindon in June, 1925.

The Medical Fund Society was established at Swindon in 1847, and is available for all members of the company's staff employed in that area. The objects of the society are to provide for members and their families medical and surgical attention, and medicine.

Unique in character, being the only one of its kind in the country, it owns washing, Turkish and swimming baths (which are open

to the public of Swindon as well as to the members of the society), in addition to a well appointed dispensary, while its many other activities include an up-to-date and effective dental department. The committee of the society is responsible for the government of the accident hospital, situated close to the works, wherein cases of mishap occurring in the works receive immediate attention. The hospital also deals with a limited number of cases, requiring special surgical treatment. The medical staff consists of the medical director and consulting physician, consulting pathologist, consulting radiologist the chief surgeon and nine assistant medical officers, while the hospital staff consists of the matron and seven nurses, the dental department being under the direct supervision of a dental surgeon, with three assistants and two nurses.

The membership of the society totals nearly 16,500 which number with the addition of wives and dependants, represents a total of between 38,000 and 40,000 for which the society accepts obligation in regard to medical and surgical attendance as required.

A relative, though independent, society, is the Great Western Railway Locomotive and Car Department Sick Fund Society. This was established in 1844 by the employes to provide allowances during illness, with a superannuation allowance on retirement. The number of members is approximately 7,000.

There are approximately 1,600 apprentices in the chief mechanical engineer's department. In the locomotive department about 1,100 boys are apprentices to such trades as engine fitting, turning, erecting, boilermaking, coppersmithing, blacksmithing, moulding, etc. In the car department about 500 boys are trained to coach bodymaking, coach finishing, coach trimming, carpentry, etc.

New Station of the Great Western Railway at Newton-Abbot, England. Wide World Photo.

Special courses of training have been prepared in each instance, so that every boy may have a thorough all round experience of the trade to which he is apprenticed.

Most of the apprentices are sons of the departmental employes and, in cases where the fathers have been in the service some years, no payment is demanded for apprenticeship; but in every case boys must have reached a satisfactory standard of education before acceptance. The company also receives a strictly limited number of boys as premium apprentices.

During the period of training, systematic reports are rendered and every endeavor is made to insure that the boys are employed in an occupation suitable to their ability. Where this is not so, transfer to another trade is, where practicable, arranged.

In addition to the means employed for insuring thorough practical training, apprentices are impressed with the necessity of attending a suitable course of theoretical instruction. To this end. there is cooperation with the local educational authorities at the various towns where the company had depots, and engineering courses are arranged to cover the needs of all trades concerned.

Besides evening classes we have a day studentship scheme under which the best of our boys attend specially arranged day classes, this company paying school fees and wages during absence from the factory. This is the chief source from which we select young men for our drawing office, chemical laboratory and supervisory posts.

The Swindon Engineering Society was established in 1893 to afford opportunities for its members to acquire engineering knowledge, and to discuss the most recent engineering developments.

During the winter papers are read by prominent engineers, while visits to engineering centers are organized in the summer months. The membership of the society is 390.

The Great Western Railway Social and Educational Union was organized to promote and encourage social, recreative and educational organizations. Membership is open to all members of the company's staff, their wives and dependent children; also pensioned employes, and the widows of the deceased employes. Branches are established throughout the company's system.

The Great Western Railway Magazine is published monthly. It includes articles by members of the official staff. A descriptive account of safety work on the Great Western Railway was included recently in a wireless broadcasting program and reproduced

in the Great Western Railway Magazine.

The St. John Ambulance G. W. R. Center is controlled by a central ambulance committee. For the purpose of organization the company's system is apportioned into divisions. A divisional committee is appointed to deal with the formation of classes, etc. In connection with these lectures, examinations are held at the end of each session for students who have attended first aid lectures. The awards are as follows:—

First year examination—certificate.
Second year examination—voucher.
Third year examination—medallion.
Fourth and subsequent examinations—labels.

Members of the staff obtaining the medallion award have the fact recorded in their service history. Ambulance men who have passed 15 first aid examinations are awarded the company's gold efficiency medal, and a gold bar is added for 20 years' efficiency. This award carries with it an additional day's leave annually, provided efficiency is maintained by yearly re-examination. Competitions are held at the end of each session, two cups being competed for, and prizes are awarded by the company. A large number of accident cases are dealt with yearly, in addition to numerous cases of minor injury.

The King and Queen of England Visiting the Great Western Railway Shops—They're Called "Works" Over There. Sir Felix Pole Is Second From the Right. Wide World Photo.

Railways to Use Airplanes

It may not be very many years before passengers will cross the continent in 2½ days by a combined air and rail transport system. For comfort, air travel would be restricted to the daylight hours. Planes will land in the heart of a city by utilizing train sheds as landing fields.

Such things come about, as most folk know, through the activity of men and vision. A man of this type is Parke Adams, president of the National Aeronautics Association. Mr. Adams said, recently, in Washington that railroad executives are showing increasing interest in the possibilities of airplane transportation, and many important roads are now considering such projects.

A report has come to him, Adams said, that one of the country's largest roads has recently bought 50 planes as an auxiliary to its service between two large cities and intends to put them in operation soon.

Adams said aviation's need now is to combine the railway men's knowledge of transportation problems with the skill of practiced pilots and trained aviation engineers. The future of flying, he said, rests with the transportation men of the country. They are best fitted to operate air lines and to educate the public into patronizing them, just as they have "sold" the public on fast trains.

Last summer's trans-atlantic flights awakened a tremendous psychological interest in flying and the aviation industry is now endeavoring to translate this interest into commercial development Adams said.

Conductor Hit Him—$500

Andrew Huden, negro, in a suit against the Augusta-Aiken Railway & Electric Corporation, has received a verdict at Augusta, Ga., for $500. The plaintiff claimed no damages except an unlawful assault upon him and sued solely on the act of the conductor.

The man who loves home best, and loves it most unselfishly, loves his country best.—J. G. Holland.

One of the New Three-Voltage Locomotives for the Sacramento-Northern Railroad Company.

Three Voltages on These Locomotives

Two new 68-ton locomotives recently placed in service on the Sacramento-Northern R.R. are arranged for operation on three voltages. This unusual feature will enable them to be used on the present system where power is collected from either a 1200-volt overhead or a 600-volt third rail and on an extension of the system which is under way, where a 1500-volt trolley will be used.

Including the two new locomotives, the Sacramento-Northern is now operating 14 electric locomotives ranging in size from 42 to 68 tons. The first of these were placed in service nine years ago. Recent figures on their operation over this period show excellent results.

Average Costs, Cents, Per Locomotive Mile

	1918	1919	1920	1921	1922	1923	1924	1925	1926
34 Equipments	4.90	8.18	7.69	6.70	6.18	6.33	3.65	3.95	4.33
67 Supplies	0.27	0.41	0.81	0.30	0.27	0.23	0.27	0.17	0.14
70 Inspection	**0.78**	**0.89**	**1.35**	**0.78**	**0.43**	**0.45**	**0.62**	**0.50**	**0.57**
Total	5.95	9.48	9.85	7.78	6.88	7.01	4.54	4.62	5.04
Mileage	217276	241278	237545	215426	241391	234933	233938	269821	315897

These figures are low when it is considered that a locomotive mile, as far as the locomotive costs are concerned, represents a train mile which amounts to 1500 tons trainload in the busy season.

The mechanical parts for these locomotives were built by the Baldwin Locomotive works. The electrical equipment was built and the complete locomotives assembled by the Westinghouse Electric & Manufacturing Co., and shipped on their own wheels to California.

New Three-Power Locomotive

A new battery-oil-electric locomotive, carrying its own power plant and the first of its kind ever built, was recently tested in New York by the New York Central Railroad for which it was constructed for service in freight yards which are not completely electrified and where part of the time is required to operate through city streets.

As this new locomotive will be required to operate at times over tracks which are electrified, third rail shoes are provided, with an overhead collector. This permits the operation of the traction motors from external sources or supply when in electrified districts.

The new locomotive weighs 128 tons in working order. It is a product of designs by the New York Central's electrical engineering department working with the General Electric Co. and the Electric Storage Battery Co., and was built by the American Locomotive Co.

When the locomotive is operating in the non-electrified sections, the power is supplied by an Exide storage battery of 218 cells weighing 17 tons, one of the largest batteries ever used for locomotive service. The battery is charged by a 300 horsepower Ingersoll-Rand oil engine, connected directly to a 200 kilowatt General Electric generator. This is so designed that, if it is operated when power is being supplied to the traction motors, it will divide the load with the storage battery in periods of heavy output without overloading the engine and will return automatically to charging the battery as soon as the load has decreased. The battery supplies the surges of power required in switching service when a locomotive must respond quickly.

The locomotive, which is 46 feet eight inches long over the couplers, is a swivel truck type with a cab in three sections, the batteries being carried in the end sections and the oil engine in the central section. The batteries are arranged in tiers. The central section of the cab, in addition to the power plant and control apparatus, has two small operating compartments for the enginemen. There are doors giving access to each operating compartment from the outside and to the power plant from the operating compartment.

Self Training

Bruce Addington says a slap in the face is harder to forget than a pat on the back. Bad things, unpleasant things, ugly things, and nasty things have a way of sticking to us; and good, pleasant, beautiful and wholesome things, such is our conceit, we are prone to take as matters of course and pay little attention to them.

But here precisely is where the will comes in. Here is the opportunity for self-training. Here is the secret of improvableness.

Editorial Comment

The Moffat Tunnel Complete

THE outstanding event of the past month in railroad annals was the opening of the great Moffat tunnel, six miles in length, under the Continental Divide. Twenty-five hundred men went up there in special trains to attend the ceremonies, to cheer the men who have labored for years to complete the work, and doubtless to give "the passing tribute of a sigh" for the fine gentleman who conceived the project and died six years before it was finished.

Discussion turns logically to the uses to which the tunnel will be put. All kinds of rumors have been current for months concerning just which road or roads are to use it. All such speculation is idle owing to the fact that the ownership of these lines, including the Rio Grande, the Western Pacific and the Denver & Salt Lake,—the holding company in the new tunnel—is something of a community of interest. One writer, usually close to the mark in his target practice among railroads, has the Burlington, the Rio Grande, the Western Pacific, and the Denver & Salt Lake about to complete a compact by which all will benefit from the shorter route. All of which, of course, would mean stiff competition for the Union Pacific-Chicago & North Western, and the Central-Southern Pacific Systems.

An Unsound Resolution

Senator Glass of Virginia is trying to have the Hoch-Smith Resolution repealed. Three rousing cheers. He ought to succeed. Of all the unsound, uneconomic laws imposed upon the railroads this is the worst, with the single exception of the Recapture Clause in the Transportation Act. This resolution has cost the railroads and the people at large—which is the same thing—many thousands of dollars and has benefited no one, not even the farmers for whom it was conceived. Write to your congressman if you know his name.

Dirigible Passenger Rates

If the R-100, British dirigible, fulfills the hopes of its sponsors in a test flight to the United States next fall, effort will be made to provide trans-Atlantic dirigible service to travelers at a charge of not more than $600 a passenger.

The average fare from New York to Queenstown is about $200 at present. In the winter you can go cabin for about $198, in the summer for $250, and it is possible to get over for $145. Of course if you aren't very particular about your lodgings and food it is possible to cross the Atlantic for $30 or $40, steerage. But steerage passengers are not likely ever to make reservations on airships. Persons to whom five or six hundred dollars is just pocket money won't object to paying that much for a ride on the R-100. We hate to be crepe-hangers, but it does seem perfectly safe for the great steamship companies to go right ahead with their plans to continue in business at least for a few years.

Eventually a daily service will be developed, declares Commander Charles D. Burney of the Airship Guarantee Co. of England, who is in the United States arranging details of the test flight. Passage costs, he believes, will gradually approach ship passage rates and will presently drop to $250.

The Paragon

Ordinarily, this piece should be printed in the monthly collection of "Queer Things That Happened," but the rule is violated this time for obvious reasons. The item is reproduced here with all its imperfections and its refreshing assumption of wisdom for the delectation of railroad executives who hunger constantly for advice in running their business, as do editors of newspapers and magazines. It comes, of course, from Beverly Hills, and is by the nation's guardian-at-large, Will Rogers.

"They say the railroads are going to cut off three hours going east from California to Chicago. I don't know why they don't cut off 12 coming this way. There is not a road west of Chicago coming out here that couldn't take off a full night, or day. When they get these aeroplane lines going fine they will make these railroad birds step out here like the trains do east of Chicago. You won't see 'em stopping at every little place. There is not a schedule out here that can't let a train be three hours behind and then make it up in one division. They do it all the time."

"He who considers himself a paragon of wisdom," said the philosopher, Ludwig Tieck, "is sure to commit some superlatively stupid act."

Ford and Edison As Kidders

The fame of Thomas Edison will never be increased through the efforts of newspaper reporters trying to present him as a humorist. We all know

what we owe Thomas Edison in this country, but about once a month we think the bill is crooked. Henry Ford, too, has contributed much to the joy of living—didn't someone say he is the man who made walking a pleasure?—but when a newspaper peddles a yarn about these two celebrities kidding each other, acting up funny in public, it is the dullest kind of drool. Ford may have said something witty, which is doubtful, but if he did Mr. Edison didn't hear it.

"Whistling Away Friends"

A railway official who, for quite obvious reasons, does not care to have his name used, has written us respecting the wisdom of locomotive whistling, and its probable effect upon the careless or thoughtless public. "I quite agree with you," says this writer, "as to the uselessness of the whistle at highway crossings. I believe it is only adding to the death list instead of reducing it. Everything we do toward relieving the individual of the responsibility that God placed upon him is weakening him to that extent. We can expect improvement only in proportion to the development of the individual."

Destructive or Boneheaded?

Something happens every little while to make us resent what Dryden said about men. "Men," said that philosophical poet, "are but children of a larger growth." There are times when this seems a cruel libel on children. Occasionally we do see the really destructive child, but how many boys, do you imagine, would deliberately scratch a long mark on the side of a motor car, a piano, a shining, new suburban railroad coach? Not very many. How many men would scratch a match on the smoothly painted side of their own houses, or any other house, for that matter?

Why, then, do so many men become flagrantly destructive where a public building or a railroad coach is concerned? Is this just one more of life's unfathomable mysteries? Or do such men belong by classification with those abnormal mentalities whose moronic outbursts are found inscribed upon the walls of telephone booths, and other places less vocal?

An official of the Rock Island Lines entered the general offices in Chicago, not long ago, with a scowl upon his face. Passing through the train shed he had seen a commuter scratch a match on the side of one of the company's brand new suburban cars, leaving an unsightly mark that could be seen a block away.

The official missed a fine opportunity. If he was big enough he should have kicked that commuter off the property. Or he might have had him arrested and punished under the provisions of a city ordinance. If a Rock Island attorney had prosecuted the case and made it sufficiently interesting every newspaper in the city would have had the story on the front page, and millions of dollars worth of property all over the country might have been saved from such defilement in the future. Or, if the official didn't care to kick the person or have him arrested he might at least have separated him from a few of his teeth. Such a demonstration would have been highly valuable, however undignified it may seem at first glance. And it would have had the further advantage of much publicity.

If the Rock Island powers reject all these well meant suggestions we have one more to offer: Advertise! Tell the public that if it must scratch matches it will find sandpaper or some other contrivance in every car conveniently placed for its use near the door on the way out. Or the company might save money by giving all commuters pocket lighters once a month. However, this doubtless would cause an outbreak of gambling among men willing to give long odds against the things' lighting on the first attempt. The entire episode is filled with vast possibilities. We hope it may be referred to Mr. Dickinson, the genial general counsel of the Rock Island.

They're Still Doing It

"There are persons who constantly clamor," said the late Daniel Webster, a very long time ago, as if writing for 1927. "They complain of oppression, speculation and pernicious influence of accumulated wealth. They cry out loudly against all banks and corporations and all means by which small capitalists become united in order to produce important and beneficial results. They carry on mad hostility against all established institutions. They would choke the fountain of industry and dry all streams.

"In a country of unbounded liberty, they clamor against oppression. In a country of perfect equality, they would move heaven and earth against privilege and monoply. In a country where wages of labor are high beyond parallel, they would teach the laborer that he is but an oppressed slave."

For the Rainy Day

Uncle Sam's great family of 117,000,000 piled up an income of $90,000,000,000 in 1926.

In making this figure public the bureau of internal revenue announced that it marked an increase in national income of approximately $27,000,000,000 since 1921.

For 1927 experts said that the national income probably would equal or slightly surpass that of 1926.

In spite of the higher standards of living, colossal installment buying which has put automobiles, radio sets and other luxuries and semi-luxuries

in an ever great number of homes, the American people on June 30, had approximately $26,000,000,000 deposited in savings accounts.

Savings accounts have grown an average of $1,675,000,000 every year since 1919. Final figures for national bank savings at the close of the 1927 fiscal year show a gain of over a billion dollars in 12 months.

For 1926 internal revenue figures show that the average income "per person gainfully employed" was $2010, compared to $1851 in 1920. The 1926 income, however, was worth but $1186 on the basis of 1913 dollar values.

Government Ownership

The Sims bill, sponsored by the Public Ownership League, and defeated a few years ago in congress, was only one way of getting government ownership of railroads in the United States. Stationary freight and passenger rates, or reductions in those rates, with constantly increasing costs of transportation form the basis of the second method of bringing about that undesirable situation.

Are the shippers of this country and its legislators in congress entirely dumb or are they actually seeking to put the railroads back where they were in 1917-18-19-20? Do they read the newspapers?

The average railroad employe is not an advocate of government ownership of anything. But, like any other wholly normal human being, especially one with a family, and a home to pay for or to hope for at least, this average chap listens eagerly when some chairman says he is entitled to an increase in his wages. This is a perfectly natural attitude, and this magazine doesn't wish to be understood as attempting to discount it, or to frown upon any man's efforts to improve his condition in life.

But one inescapable fact must be impressed upon these men: If wages are to continue going up, and we certainly hope they do, then rates must be increased. If the first happens without the second the result is inevitable. The government, getting its money from the people without much difficulty, will be forced once more to take the railroads. To a person on the outside looking in, no other conclusion seems possible, and within a very few years at that. If the organized and endless demands for higher wages are intended as the method adopted by labor leaders to force government ownership it is extremely likely to prove successful. You can not continue to draw molasses out of a barrel after it is empty.

Wage increases have been made on the western railroads which amount to $27,000,000 annually. In addition to these large increases already granted, the western roads are now confronted with wage demands from their trainmen and engineers which amount to more than $32,000,000 a year. On railroads as a whole the wage increases granted at this date, amount to more than 60 million dollars.

Testifying before the Interstate Commerce commission in Chicago, last month, in connection with rates on live stock, Kenneth F. Burgess, general solicitor for the Burlington, said that in 1927 the net earnings of the western lines showed a decline of $42,000,000, or of almost 11 per cent below the level of 1926. "One of the largest contributing causes for this decline," he said, "has been the great increase in wages which the western roads have been compelled to pay to their employes, through mediation and arbitration. The present western railway wage levels either closely approximate or exceed the post-war peak wage scales which were fixed by the United States Railroad Labor Board in 1920.

"Western carriers opposed the wage demands of their employes before the various arbitration boards. Further, they presented evidence showing that these wage increases, if granted, must be followed by increases in freight rates, if the western railroads are to continue to provide adequate transportation. The employes contended that increases in wages would result in general prosperity, and in the ability of the shipping public to pay higher freight rates.

"In Western Trunk Line territory alone, net earnings in 1927 showed a drop of almost $9,000,000 below 1926; the wage increases which these same roads have been required to make amount to $6,000,000 annually. The case of the Chicago & North Western illustrates vividly just what this means to the individual roads. In 1927 that company suffered a reduction of about $2,000,000 in net earnings; this amount is almost exactly the same as the annual wage increases secured by its employes in that year. Further, the North Western is now facing wage demands from its employes for additional wage increases totaling $8,000,000 yearly.

"Even more startling than this is the situation relating to the Chicago, Milwaukee, St. Paul & Pacific, which has just emerged from receivership. The net earnings of this company in 1927 were $14,000,000, a decline of $4,000,000 from the year before. Since the passage of the new Railway Labor Act, the wages of the employes of this company have been increased more than $2,000,000 annually, while at the present time this road has pending additional wage demands of other employes aggregating more than $12,000,000 a year.

"Then, too, the taxes of the western lines have been increasing in alarming proportions. In 1926, the latest year for which full information is now available, the taxes of the western railways showed an increase of almost $28,000,000 over the corresponding total for 1921. These two factors of increased wages and higher taxes must largely determine the future level of freight rates in western territory if

the public is to continue to receive adequate railroad transportation."

But the railroads face another unjust handicap not imposed upon any other great industry—the Recapture Clause of the Transportation Act of 1920. Under this act the order has gone forth, long delayed because of doubt concerning the date upon which the law should become applicable, for railroads to turn over to the government 50 per cent of all they have earned in excess of six per cent since 1920.

How would the lumber industry like to have this law applied to that business, or the automotive industry or any other great semi-public enterprise? True, the Recapture Clause will not hit very many railroads, but is it any more unjust for that reason? This clause was intended to equalize the rate structure but it penalizes the short lines once in a while, and when it does it wipes out all chance of making up for the poor years. Indeed this is the effect everywhere. Once a railroad has lost money because of reduced traffic volume in a bad year it has no chance to recover it in better times. As surely as if the courts sentenced them with heavy fines the railroads have lost that money forever.

In the face of these discouraging conditions it certainly is worse than short-sighted for the shipping public to continue its demands for reduced rates. And it is just possible the railroad employes may have reason in this generation to question the wisdom of their leaders.

Speaking along these lines, not long ago, C. D. Morris, assistant to the chairman of the Western Railways Committee on Public Relations, showed how rates have been reduced in recent years. "The average rate charged for carrying a ton of freight one mile," said he, "was 1.275 cents in 1921. In 1926 this average ton-mile rate was 1.081 cents, while the first nine months of 1927 it was 1.077 cents. By this better railroading, therefore, and the large investments on capital account each year, the shipper has not only enjoyed a superior service, but at lower rates, a result that has been most pleasing to him.

"But what of the future? So far as can be foreseen it is safe to say that the railroads will go on providing the same satisfactory service to which we have become accustomed. Strenuous efforts are being made by them at all times still further to improve it. The lessons of the past, however, should not be forgotten. What cooperation between the roads and their patrons has done in the matter of eliminating car shortages suggests that other equally important things may be accomplished in the same way. The regulation of the roads is becoming more and more rigorous year after year; their labor bills and taxes mount higher and higher annually. It has been impossible for them to earn a fair return upon their invested capital for years, notwithstanding their constant effort to economize on operating account. This situation can not go on indefinitely without injury to both railroad and shipper. Is it not high time the public was interesting itself in the matter of obtaining fair treatment of the carriers by the regulatory authorities of both state and nation?"

Isn't it about time?

The Editorial of This Edition

THE Box bill, now before congress proposing restriction of immigration of Mexicans to this country, revives memories of the Indian wars of early days, because of the amazing ignorance apparent in the national legislature with respect to actual conditions. In the days when the efforts of the whites in pushing the frontier westward were opposed by the retreating red men it seemed as difficult to impress the East with the truth of the situation as it is now to make congress realize the economic loss to be imposed upon the West and Southwest if the Box bill becomes a law. Two great and extremely important industries would be affected seriously, agriculture and railroads, a loss which must be prevented. What congress seems slow in learning is that if Mexican immigration is restricted the damage to agriculture will most certainly be felt not only in the West and Southwest but in every part of the nation because the foodstuffs and the cotton produced west of the Mississippi are needed, and very constantly throughout the country.

But still another very important consideration is involved, and should not be forgotten: Roadmasters of the future. Where are they to come from? Railroad managers are seriously concerned over the source of labor supply for track work, but they are even more keenly interested in the supply of human material for competent direction for the men doing that work. Up to the present a foremanship of a section has been the Mexican's limit, and most of the men promoted to this post were born in the United States and educated here. This education has seldom gone beyond the grade schools, which is doing very well and very much better than the men might have had in Mexico; but even with this degree of enlightenment railroad superintendents have found it difficult to induce such foremen to make out the monthly or weekly reports no matter how important. In this generation at least the Mexicans have shown lack of the qualities needed for leaders. But the man who says Mexicans do not become good citizens, adapting themselves readily to American ways of living, doesn't know what he is talking about. No better or more dependable testimony favoring Mexicans for railroad work could be needed than that of W. H. Whalen, for 17 years a division su-

perintendent for the Southern Pacific, whose experiences were described so interestingly in Lee McCrae's article in the October number of this magazine. "Once fed and clothed," said Mr. Whalen, "given decent home and wage for the first time in his life, the Mexican becomes a good worker. The women are especially eager for civilization; you never saw so much laundering. Their eagerness for the children to speak 'Americana' and be 'Americana' is pathetic."

But they don't become roadmasters. If any reader of Transportation knows a Mexican holding such a position he can add much to the interest of the present discussion by writing about it. Most roadmasters, as all railroad men know, are Irish, or at least of Irish ancestry. In an age when politics, industry, business, offer so many much more attractive and lucrative opportunities to the descendants of the original tracklayers why should any of them turn away to accept the drab responsibilities of roadmastership? They aren't doing it.

The original railroads westward were laid by the Irish. True, there were veterans of the Civil War in those forces innocent of Celtic blood, but in the largest consideration it was the Irish who put down the first track. For the most part they were hard-fisted, hell-raising, Indian fighters, natural foes of the heathen Chinee who brought the track eastward for the Central Pacific toward Promontory, but these Irishmen were of the breed that lived hard times and liked them, worked diligently amid great dangers, drank anything liquid if it was hot enough, and believed implicitly in the road for which they toiled. Their descendants became the roadmasters and the bridge and building superintendents of a later and more peaceful day. There were no better workmen anywhere.

But all this happened 60 to 70 years ago. Nowdays most of the descendants of those pioneers in railroad construction have softer hands, unbruised knuckles. They go in for pleasanter, more profitable things. They are contractors, aldermen, ward and state leaders, policemen. The few surviving roadmasters of the old breed are retiring on pensions. Where shall we find their successors?

Down across the years without a quavering note, an old song comes to mind, a classic in its time: "Jerry, Go Oil the Car." Every veteran track man knows the lines. They were inspired by the Irishman's loyalty to the job he had, his belief that no other job was half so important, his earnest conviction that the six miles of his section belonged to him more certainly than to the stockholders. In asserting his little brief authority he was likely to be a bit tyrannical with his gang, but the men understood, and the work was done and done right. The foreman's business car was pumped out in the morning and pumped back again at night with many a lusty cuss-word, a highly intricate and exceedingly delicate piece of machinery—in the foreman's opinion—long since relegated to the scrap heap on well managed roads. Now the workmen go over their sections on motor cars, seated, instead of taking six miles of backbending before beginning the day's job. A new and faster age, an age of labor saving machinery, but nevertheless an age needing expert direction from above. Where are the roadmasters of the future to come from? Perhaps someone has an answer ready. We should like to see it.

Advance in Refrigeration

Improvement in refrigeration is making it possible for ships to carry perishables for greater distances than ever in the past. Under old methods, no matter what temperature was maintained fruits would not keep for any great time because of the lack of ventilation. The new system adopted in many ships recently cools through air circulation. So successful has this proved that ships are taking fruit to the other side of the world and delivering it in good order. The point to all this lies in its adaptability for the Panama Canal. The more perfect refrigeration becomes in ships the more traffic will be lost to our railroads. Something always is taking the joy out of the traffic man's life.

The Country Well Insured

The total amount of insurance in force in this country one year ago was 64½ billion dollars. The assets of the insurance companies amounted to 13 billions. Certainly it is no less at the beginning of 1928. The point of especial importance here is the fact that the insurance companies are mightily interested in railroads, financially interested, and it stands them well in hand to lend their influence in seeing to it that no harm comes to those properties.

The Gentle Tone

The superintendent, far up town, called his office late one night to inquire about one or two of the things that seem to worry such officials at all hours. The man who answered the telephone bell roared into the instrument loud enough to be heard a block away if the window had been open. The superintendent asked his question, quietly, and received the needed reply in a much quieter voice. And then, said he to the clerk, "Come to my office in the morning. I wish to see you."

"Son," said the boss, the next day, when the grouchy clerk showed up, "I don't like the way you answer the telephone. If that's the way you speak to the men or the public, you don't belong here.

Just one such experience as I had last night might cost this company the business of a shipper forever. If you speak to your wife that way you must have married her under false pretenses. But she doesn't dare say, as I do, that if you don't adopt a gentler tone you're going to find yourself in serious trouble. I really ought to fire you at once but I'll give you a chance, and let me say that you'll be watched in the future."

The grouch never did loyal work for an employer. He's bound to be dangerous. The man who doesn't like his job well enough to treat it decently shouldn't have a job.

Charles Kingsley, a philosophical writer of great good humor, was a constant and consistent advocate of smiles and resonant laughter. "Thank God every morning when you get up," said he, "that you have something to do which must be done, whether you like it or not. Being forced to work, and forced to do your best, will breed in you temperance, self-control, diligence, strength of will, content, and a hundred other virtues which the idle never know."

In this connection it is interesting to reflect somewhat on the duties assigned to E. A. Hamilton of the Union Pacific. Mr. Hamilton was appointed to a new kind of job last September by General Manager Jeffers. He is Courtesy Director, with headquarters at Omaha, and is in charge of matters pertaining to courtesy and correct methods of conducting station and train service so far as those methods affect the company's relations with patrons, and "such other duties of a similar character as may be assigned to him." In this capacity Mr. Hamilton acts as an adviser to station and train employes, affords a means of direct contact between them and the division and general offices, and has a general survey over service to the public.

This is a fine idea. So far as we know, after many years' traveling, this is the first of such positions. No other man on the system can do quite so much for the company. Doubtless Mr. Hamilton was selected because of peculiar qualifications for the place. We hope so. It must be admitted, however, that next to the job of secretary of a commercial club this man has duties calling for the exercise of more patience, tact, diplomacy, tolerance, than any job of which we know anything. When trains are late, which does not often happen; when the windows stick, which usually they do; when all the lowers are gone and no one will take an upper; when everyone, the clerk included, is showing the lack of self-control and good temper, we should like to be in a safe place to observe just what Mr. Hamilton does or what the employes do under his direction.

The average railroad man, especially in the train service, is a decent chap, but there are a few grouches, as might be expected. The public seldom remembers or is willing to acknowledge that these employes have to put up with a great deal of petulance, of unreasonableness amounting to childishness among patrons of the road. Smiles and the gentle tone make friends for the company, and rob a nasty passenger or shipper of his entire case. It isn't always easy to remember these things in trying moments but it certainly is worth while making the effort.

Service and creation of good will are so important from a traffic getting standpoint in railroading that a progressive organization loses no opportunities to bring about these desired ends. On mouthpieces of telephones in the main offices of the Erie Railroad are attached pasteboard cards with the following advice to officers and employes: "Always be Courteous! Please bear in mind that in using this telephone the person at the other end of the line is speaking to the Erie Railroad Co. Your courtesy will result in fostering the good will of and make new friends for our railroad."

The Importance of Reading

The employe who doesn't read the literature of his profession is rarely or never promoted. He doesn't know what is going on in the business world. He isn't fitted for advancement.

Speaking, not long ago, to the Younger Railroad Men's Conference, President Harahan of the Chesapeake & Ohio said, "It is surprising the amount of information you will obtain through application to good reading in regard to the work you are doing. There are a great many railroad periodicals, both of a general and specialized nature, that contain articles of great value to you, and it is really something that will be interesting to you if you keep it up."

President Harahan was right, but he neglected a fine opportunity. The fact is that no real reason exists, except indifference, for the dense ignorance of most railroad employes in respect to the financial, or even the historical story, of the property on which they work. How many of them know how to reply to an unwarranted attack upon their employers? How many—and this includes officials—know anything about the famous net return, the Transportation Act or the Act to Regulate Commerce? One need not be a lawyer to understand these things.

To a certain extent the railroads are to be blamed for this situation. They spend large sums for education in Safety First, but how often is a public relations director sent to the meetings? One of the most important precautions the railroads could teach is that the first safety for their common good lies in establishing and then continuing pleasant, friendly relationships with the public. Three cardinal rules should be insisted upon: Be on time; in case of doubt take the safe side, and read the literature of your business.

John Esch the Storm Center Now

Hoch-Smith Measure Attacked

By W. E. Hopkins

THE renomination of John J. Esch as a member of the Interstate Commerce Commission has been the cause of much criticism of the commission, as well as of Mr. Esch. The principal attack against the commission has come from coal operators in Virginia, West Virginia, Kentucky and Tennessee, growing out of the commission's decisions in the so called Lake Cargo Coal case in which it was alleged that Commissioner Esch had changed his vote, thereby permitting a lower freight rate on coal for the lakes from the Pennsylvania and Ohio fields than from southern fields.

Commissioner Esch, before the senate interstate commerce committee, testified his vote in the last case was based on the fact that entirely new evidence was submitted, and that he was so justified in modifying his position. It was alleged also that the adoption by congress of the Hoch-Smith resolution also had to be taken into consideration by the commission in deciding the case, the resolution having opened up the whole rate question. As a result former commissioners Henry Hall and Edgar E. Clark, as well as Chairman Campbell of the commission and Commissioner Aitchison were among those who appeared. Mr. Clark said he did not think the resolution conferred on the commission any power which it did not have prior to the adoption of the resolution except the so called policy provision. He said he thought the adoption of the resolution was a mistake and that it had done a world of mischief. Furthermore he said he did not think the resolution had done any good.

Other witnesses took the position that the resolution had greatly increased the work of the commission and had the effect of law. All witnesses praised the integrity of Commissioner Esch, however, and belittled any charge or insinuation that he had changed his position for political reasons or because he desired to be reappointed.

Where All the Rumpus Takes Place.

And thus the pot continues to boil, During the hearings, Senator Glass of Virginia, who opposes the reappointment of Mr. Esch told the committee that if the Hoch-Smith resolution has given the commission any additional power that he favors its repeal. Since making that remark, Senator Glass has introduced a bill which provides for the repeal of the resolution.

Growing out of the present controversy over Mr. Esch's reappointment, Senator Sackett, Republican of Kentucky, who is also among those opposing Mr. Esch, has introduced a resolution directing the senate interstate commerce committee to investigate the existing rate structures of freight rates on bituminous coal "to determine whether there exists injustices and unfairness therein, and whether any mining districts are being unfairly or abnormally stimulated and overdeveloped or are being depressed thereby."

The resolution also calls on the committee to ascertain "the power, authority and practices of the Interstate Commerce Commission under existing law to control the minimum freight rates to be charged by railroads for the purpose or with the effect of increasing or preventing competition between mining districts in different states by equalizing the costs of production and distribution in industry through the requirement of transportation charges upon bituminous coal that are more than compensatory to the carriers performing the services of distribution."

In addition, the senate by a vote of 68 to 1, the one being Senator Bruce, Democrat, of Maryland, has already called on the commission for copies of the various decisions in respect to rates rendered by that body during the past five years "in which its decisions as to the reasonableness of any rate or rates was in any sense influenced by the competitive advantage of the producers in one state, district, or section as compared with the advantage or disadvantage of the producers in another state, district or section." What will be done with this information when the senate receives it, has not been disclosed.

During consideration of the resolution, there was considerable discussion of the lake cargo cases. In addition Senator Trammell, Democrat, of Florida wanted to know whether the rates on citrus fruit from California and Florida had been considered and were in proper relationship.

While the commission has been drawing some fire from the floors of both the house and the senate for the past year, the fire has been more concentrated during the past few months with Senator Reed of Missouri and a number of others making speeches criticising the work of the Interstate Commerce Commission.

Consideration of the Parker railroad consolidation bill is still under way before the house interstate and foreign commerce committee with prospects of the bills being favorably reported to the house soon. Progress was slow until late in February when the committee finally decided to remain in all day sessions in an effort to expedite matters. The senate committee has not concluded hearings on the bill but will do so shortly. Chances for action on the bill in the senate however continue decidedly gloomy even though the house should act favorably on it.

Aside from the consolidation bill and the Esch nomination neither house nor senate committee has been giving much consideration to any legislation affecting railroads. The senate committee did order favorably reported recently the bill introduced by Senator Pittman, Democrat, of Nevada, which would allow certain short line railroads to be exempt from the recapture provisions of Section 15a of the Transportation Act. Passage of this bill by the senate is expected with probably favorable action by the house later in the session.

The house merchant marine and fisheries committee has just started hearings on merchant marine legislation, but it probably will be another month before any final action is taken. Included within the scope of the hearings is the bill introduced by Senator Jones, Republican, of Washington and chairman of the senate commerce committee designed to continue the government in the merchant marine business, but President Coolidge has already indicated his disapproval of this bill. Any bill favorably reported by the house committee is expected materially to modify the Jones bill.

Plans are under way to bring about the early consideration by the house interstate and foreign commerce committee of legislation for the regulation of motor buses and possibly trucks. Extensive hearings are planned by the house committee but in view of the apparent disinclination of the present congress to get down to its real functions of enacting legislation there is some doubt whether any legislation of this nature can be passed before final adjournment some time early in June.

On the basis of the proposed report recently submitted to the commission by Examiner Leo J. Flynn, the Interstate Commerce Commission has heard arguments on the regulation of motor trucks and buses with representatives of the railroads and motor vehicle operators present. While federal regulation of motor vehicle operations usually is favored by the railroads, the manufacturers and operators of motor trucks are opposed to such a step. This opposition is based principally on the ground that it would retard the development of this new mode of transportation and hamper the flexibility of operation.

Considerable interest is being manifested by the railroads over the recent complaint issued by the I. C. C. against the Kansas City Southern alleging violation of the Clayton Anti-trust Act by that carrier in that it had bought heavily of the stock of the Missouri-Kansas-Texas which in turn had obtained control of the St. Louis Southwestern. The commission contends this form of control might serve substantially to lessen competition between the railroads involved or to restrain commerce in certain sections affected. Thirty days have been given by the commission for the Kansas City Southern to file an answer, and April 2 has been fixed for a hearing in Washington.

There is considerable speculation as to the effect of this action upon future merger plans sponsored not only by L. F. Loree but also by other executives.

A delegation of railroad executives has asked President Coolidge to include in any recommendations he may make to congress on flood control a provision for railroads to be reimbursed for the cost of replacement of spillways and bridges washed away by the Mississippi flood. The total cost of replacement was estimated at $70,000,000. The delegation consisted of L. A. Downes, president, Illinois Central; L. W. Baldwin, president, Missouri Pacific; A. A. McDonald, president, Southern Pacific Texas-Louisiana Lines; R. E. Milling, general counsel, Louisiana Railway & Navigation Co., and A. P. Thom, general counsel, Association of Railway Executives.

Lost Illusions

On his fifty-fifth birthday Senator Couzens of Michigan would like to go back to railroading.

Before acquiring millions by his connection with the Ford Motor Co., Senator Couzens worked as a freight car checker. At that time, with his illusions still intact, he found railroading "the most fascinating business in the world." Now he wishes to return to it, just as Mark Twain, after walking with kings and making the world smile with his humor, longed again to be a steamboat pilot on the broad Mississippi.—Philadelphia Public Ledger.

How Air Mail Service Has Grown

Rates Too High

By

R. H. Horton

Formerly With
Dept. of Commerce

Mrs. Frances Grayson and Three Co-Pilots Flew Away From Old Orchard, Maine, One Morning Two Months Ago, and Never Were Seen Again. P & A Photo.

THE experience gained in the carrying of mail, messages and personnel by air during the World War very probably caused the establishing in Europe, in 1919, of an airway system which has developed tremendously in the ensuing years. At the present time central Europe is covered with a net of airways which extends into Africa and Asia, and shortly will reach to the far corners of the world.

A great passenger and express business has been developed in addition to the air mail. Foreign governments have seen the wisdom of developing air commerce, and have supported these routes by generous subsidies amounting to very substantial sums. However, many of these routes, without regard to any commercial reason, serve colonial possessions for reasons best known to the state and military authorities.

European air operations are so far ahead of ours that there is no comparison. Europeans started as have we to develop air mail, but they soon learned that other services must be considered. While we continue to bend our energies toward development of mail the combined services of England, France, Germany, Italy and Holland, in 1926, flew almost nine million miles, carried 102,000 passengers, and almost 10 million pounds of express as well as nearly three million pounds of mail.

Prior to the World War no commercial air routes were continuously operating in the United States, except for some short lines operated seasonally, or an occasional few days demonstrations by private owners in cooperation with the postoffice department. A real start was made in 1918, and an experimental air mail route was established between New York and Washington. It was equipped with

military planes and operated with military personnel. It continued for a period and then was discontinued. Its operation, however, was the basis for the idea of the transcontinental air mail route between New York, Chicago and San Francisco.

Operations actually started between Cleveland and Chicago May 15, 1919, and on July 1 were extended to New York from Cleveland. On May 15, 1920, the line was extended west from Chicago to Omaha, and on September 8, in the same year, flying began between Omaha and San Francisco, by combination daylight airplane and night train service. That is, the letter was flown out of New York, put on a train in the evening at Chicago, taken off the train the following morning, and flown the remainder of the route the next day. Another route from St. Louis to Minneapolis-St. Paul was in operation by the postoffice department between December 1, 1920, and June 30, 1921.

The first private contract routes were those operated between Seattle and Victoria in the Northwest and Key West and Havana in the Southeast. The Seattle-Victoria route is still operating and is used largely for expediting mail carried by trans-Pacific steamers. The Florida route, however, was discontinued March 31, 1923.

A similar service began operation April 9, 1923, between New Orleans and Pilot Town. Another comparatively short route, but important in the matter of time saving, operated in Alaska five months in 1924, between Fairbanks and McGrath. Previously to this time the mail was carried by dog teams. Beginning July 1, 1924, night flying began between Chicago and Cheyenne, this part of the route having been lighted by the postoffice department. From this date forward, all rail transportation in connection with the air mail was eliminated. Subsequently, lights were added between Chicago and New York on the East and between Cheyenne and Salt Lake City on the West.

At the start the mail carried on the transcontinental air mail system was not of any particular class, but any two-cent mail which the department believed could be expedited by such transportation. Later, the postoffice department instituted a definite air mail service. Then the air mail route was divided into zones, the postage rates being eight cents an ounce in all zones. The postoffice department also awarded air mail contracts at rates not exceeding three dollars a pound for units of flight of 1,000 miles or less.

If Railways Are To Enter Aviation They'll Be Interested in This Aerial Ambulance Used in England. Internat'l Newsreel.

Following this, the system of air mail routes has been established. Routes which would act as feeders to the transcontinental route were developed first. On July 1, 1927, the postoffice department transferred to private contractors the operation of the transcontinental route between Chicago and San Francisco. On September 1 private contractors took over the service between Chicago and New York. During this period there has been developed an air mail system which consists of one main trunk line through New York, Cleveland, Chicago, Omaha, Cheyenne, Salt Lake City and San Francisco. Feeders to this line operate to and from Boston, St. Louis, Dallas, Minneapolis - St. Paul, Detroit, Pueblo, which is the service to Denver, Los Angeles and Pasco, Washington, which serves Portland and Seattle. Independent of the transcontinental route is the service between Los Angeles, San Francisco, Portland and Seattle. The development of these many feeder routes with a postage rate of 10 cents an ounce, the transcontinental zone rate of eight cents, with the addition of the overnight mail between New York and Chicago, which cost ten cents, brought into being a confusing condition, whereby it took a sheet of paper larger than letter size, printed in fairly fine type, to list the air mail rates between the various points in the United States. Because of this, in the spring of 1927, the postoffice department abolished the zones and established a rate of 10 cents for a half ounce between any two points in the United States in which air mail might be of service, and regardless of the number of zones or air mail routes used.

This was a step in the right direction. Despite this, our air mail contractors have been existing under conditions which might be called precarious, and what the future has in store for them is subject to grave doubt. You will remember in the earlier days, the postage rate was ten cents an ounce for every zone or line used. Letters generally run about 40 to the pound, and the government's revenue was about $4 a pound, and the contractor received not to exceed $3. Obviously the postoffice department received its full two cents a letter for collection and delivery, and a little bit more, and the contractor had the full burden of developing the air mail. The postoffice department, with the exception of the transcontinental line, has not risked a nickel. What the financial results have been and will be under this new rate, we cannot determine, and it is doubtful if we ever shall. However, it has served materially to increase the volume of mail, and this is the contractor's greatest need.

In my opinion, the method of compensation of the air mail con-

If Everyone Obeyed the Safety First Rules in the Air Fewer Flyers Would Hit the Ground So Abruptly. The Parachute Party Shown Here Is Made Up of High Salaried Gents From the Movie Settlement. Herbert Photo.

tractor and the air mail postage rate are subject to very great criticism. In the first place, the air mail postage rate is entirely too high to induce a large volume of mail. Providing a proper method of compensation is devised for the air mail contractor, the postage rates can be reduced to as low as five cents an ounce in addition to the normal two cents, and stand a good chance of paying its way. Certainly it will not involve a deficit as great as many other departments of the postoffice are incurring. From the figures made public by the postoffice department simple mathematical calculations show the earnings of air mail contractors, and demonstrate a few of the fallacies of the present method of compensation.

In the first place, does it not appear as a rather inconsistent method of developing this new kind of transport by encouraging the establishing of air lines for the carriage of mail alone, and further does it not seem rather a hardship on such a new and venturesome enterprise to require that the air mail contract be let by competitive bidding? Would it not be rather more just to reward an established air transport carrier in business for the carrying of passengers, mail or express, that is a company in the transportation business, with the privilege of carrying the air mail along its routes?

It should be recognized, as the postoffice department does now with the railroads, that the mere fact that a trip is made is of great value whether five pounds or 500 pounds of mail is carried on that trip? The railroads are paid on the basis of the space reserved for mail matter and the miles which that space travels. Air transport companies are paid by the pound regardless of the amount of space reserved, and regardless of the distance the planes travel up to 1,000 miles. That is, the Colonial Air Transport receives $3 a pound for mail which it carries 220 miles, from Boston to New York. The Western Air Express is paid precisely the same amount for every pound of mail it carries 600 miles from Los Angeles to Salt Lake City.

The argument is advanced that of course the short hop is not as great value to the air mail, and therefore the volume is less. True enough, but too much so, and although it is an important feeder to the transcontinental line it received for the first six months in 1927 a little more than $24,000 for flying a total distance of 53,000 miles, or a little more than 40 cents a mile. The Western Air Express received about $267,000 for flying 205,000 miles, or about $1.30 a mile. In the first case the amount is substantially less than the cost of operation, and the second is a very substantial amount above the cost of operation.

My congratulations go to the Western Air Express for picking this 600-mile route with its heavy traffic. Congratulations are also in order for at least two other contractors, but to the remaining ten contractors I have nothing to offer but my deepest sympathy. They are flying their routes and flying them well. They are making a trip daily regardless of the quantity of mail carried, and the mail carried may and does fluctuate tremendously. Theirs is the hardship if air mail is not developed, although theirs should not be the responsibility for developing it. Times without number have these air mail contractors flown from Chicago, Cleveland or other connecting points without mail and received no compensation although they stood by, ready to serve, and were subject to penalties if they were not on the job. There was no mail not because of

any dereliction on their part but because the transcontinental route was weatherbound, or for some other reason did not arrive up to the time it was necessary for the plane to leave in order to make its trip from the other end of the line on schedule. Such a condition is neither fair, just nor economic. I do not see how it is possible for air transportation to develop and grow as it should until some recognition is given to the readiness to serve element, the terminal cost and the mileage costs.

These criticisms have been made in a spirit of constructive suggestion and with a desire to forward the development of air transport under proper economic transportation principles.

The extent to which the air mail has developed despite the foregoing is, however, impressive and a few statistics along this line may not be out of place. During the first six months of 1927 there were flown more than 2½ million miles to carry more than 600,000 pounds of mail, and the performance in this respect is worthy of considerable admiration. Of the private air mail contractors about 4,500 trips were scheduled, 4,100 completed and 147 not started. Of the entire service about 5,200 trips were scheduled and 685 were either not started or not completed. This was attributed to the following causes:

Weather conditions	623
Shortage of equipment	30
Structural	4
Mechanical	28

This is a forceful demonstration of the fact that the perils of air navigation are rapidly disappearing upon regularly and efficiently operated air transport lines. Of the 5,272 trips scheduled only four, less than 1-10 of 1 per cent, were not completed because of structural difficulties in the plane, and only 28 or ½ of 1 per cent were not completed because of mechanical difficulties with the engine. There were operated 2½ million miles with only three fatal accidents. Frankly, many of us can look back to the time not so long ago when our pull-in records were not as good as this and we can, without hunting very diligently, find records now which are not so favorable.

Many performance records are worthy of note. The Colorado airways were scheduled to make 362 trips, and completed every one safely. Take the case of the Robertson Aircraft Co. which had 240 trips scheduled and started out on every one of them, failing to complete only nine. This is a performance record of better than 96 per cent and these nine failures were attributed to the following causes:

Weather 6, carburetor trouble 1, radiator trouble 1, and pre-ignition 1. On every trip more than 50 per cent of the distance was covered, the mechanical performance was 98.8 per cent, and there were no accidents.

This is all the more interesting and impressive when we consider that a large percentage of these miles was flown in winter weather and at night. We have all been enthusiastic over the trans-oceanic accomplishments, and the bravery of those men has been brought forcibly to our attention. No praise too great can be given to Lindbergh for his solitary trip across the Atlantic. But also, great is the praise and commendation due those men who made 100 per cent perfect start between Chicago and St. Louis (Lindbergh's training ground.) Their schedule requires leaving Chicago at 5:50 in the morning, arriving in St. Louis at 9:15, and leaving St. Louis at 4:15 in the afternoon and arriving in Chicago at 7:30 at night. During the winter it is pretty dark at six in the morning and at 7:30 at night. These pilots came out to the field and started out in their planes on every scheduled trip for six months, always covered more than half the route, finished 96 per cent of the time, and during the other 4 per cent were prevented from doing so most of the time by weather, and had no accidents.

It was this training that put Lindbergh across the ocean, and were he here today I am sure he would agree with me that those men who start out on their scheduled time day after day and night after night, regardless of what the weather man says, and regardless of their feelings at the time, are worthy of medals. They are transportation men. Let us not forget them when we are heaping the well earned honors on the heroes of more sensational flights.

Little has been done in the matter of air express except upon the subsidized lines in Europe. The rates on these lines, because of their subsidy, are very little higher than regular express rates. In fact, they are so low it is commercially feasible to ship fish and oysters by airplane express. In this country, if proper rates were charged, a lobster shipped from Maine to St. Louis would cost the hotel company more than $3 for the expressage, and I hesitate to estimate what the cost would be to the ultimate consumer when served on the silver platter.

In the first six months of this year there were seven regularly operated air transport lines in this country carrying express. These lines carried a total of 1,035,000 pounds, which seems quite a good record. Our enthusiasm wanes, however, when we find that a million and ten thousand pounds originated on the lines operated by the Ford Motor Co. between Chicago, Cleveland and Detroit. This was not commercial express but spare parts, etc., for flivvers which the Ford Motor Co. transmitted more as a test for its airplanes than for any commercial advantage accruing through air transport.

It is easy to fool yourself. It is more difficult to fool the people you work for. It is still more difficult to fool the people you work with, and it is almost impossible to fool the people who work under your direction.—Henry B. Thayer

Little Stories About Big Men

James A. Farrell, President United States Steel Corporation.

IF IT hadn't been for wire pulling in his boyhood the chances are that James A. Farrell, now president of the United States Steel Corporation, would have turned out to be a sailor. His father was a seaman. As might be expected the boy's mind was filled with thoughts of foreign ports, nights at sea, strange countries, strange peoples. Once, when he was a very little fellow, his father took him with him on a long voyage during which fuel was added to the flames, speaking metaphorically; the boy lived in such a glamour of adventure and romance that he returned to his home determined to be a sailor. If all went well, he'd be a skipper with his own ship; he would stand on the bridge and roar out his orders, and goodness knows what would happen to the tar who didn't jump when he spoke.

Then the father started out on a voyage from which he never returned. Jimmy had to get a job and care for his mother. He was 15 when this happened. The job had to be at home where he could be the protector, so into the wire mills he went at New Haven, and there he pulled wires for four years, which explains the peculiar beginning to this Little Story. All thoughts of the sea went overboard. The dreams were laid away but never quite forgotten, as his endless reading proved. Many a perilous journey he took on paper—studied many a map, but he went on pulling wire, 'tending to his job.

Four years after he had entered the employ of the Oliver Wire Company Farrell became foreman of one of the mills, supervising the work of 300 men. A strange accident shifted him from the production department to the selling, and within a few years he had risen to be general manager. It was during his connection with this organization that he began journeying to foreign ports—in fancy—with steel. Indeed he was, per-

haps, the first steel man in the country to appreciate the possibility of developing foreign markets. In 1899 a new company called the American Steel and Wire Co. of New Jersey, now a subsidiary of the United States Steel Corporation, bought a controlling interest in the Pittsburgh Wire Co. James Farrell thought of quitting and organizing a company of his own, but a telephone call from the head of the new outfit, John W. Gates, offering him the post of foreign sales agent of the American Steel and Wire Co., changed his mind. In February, 1899, he went to New York and began maneuvering ships and steel for the new organization. Two years later, in 1901, the United States Steel Corporation was formed. Not the least important work on its program was the capturing of foreign markets. The obvious man for this project was Farrell; automatically he became the head of this department.

Today the corporation owns 35 ocean vessels, carrying steel to corners of the world that other ships rarely or never touch: it owns 76 lake vessels that carry iron ore and coal from the mines to the mills; it owns 12 vessels that ply the steel pots on the Monongahela River. Nor is this all. Scores of steamships are chartered continually for special cargoes and special voyages.

Mr. Farrell succeeded William E. Corey as president of the steel corporation in 1910 when he seemed better known abroad than in his own country.

In 1913, in the dissolution suit against the United States Steel Corporation, Mr. Farrell was one of the surprising witnesses. The years of self-study had developed a memory and a knowledge of world ports and world business, as well as of steel business, that held his hearers' attention. His testimony was more than a recountal of data, given without memoranda; there was in it something romantic and stirring. His manner of recital invested the names of foreign places, their imports and exports, with glamour. He was not talking dry business routine; he was giving them glimpses of blue water, bayous, lagoons

J. A. Edson Started His Career at Sylvania, O., A Town You May Have Missed As You Journeyed Along.

and of ships going about their lawful occasions on the seas.

Mr. Farrell impressed not only by his remarkable memory, his accents were those of one enamored of the sea, who followed his ships to the remotest, exotic ports of geography.

Some persons think it's a hard task to get into the Farrell office. If this is true it's because the head of the steel corporation has learned that most callers are time wasters. But any old salt can get in if he wants to talk of the things that James Farrell still loves—ships and the sea.

And When These Boys Became Men

First time you see the name, Sylvania, you just naturally suppose it to be one of those queer quirks of geography, one-half in Pennsylvania and one-half somewhere else. So, being smart, in your own estimation, and forgetting what little Latin you ever knew for the moment, you look all along the state lines for the town, and you don't find it. But the guide letters and figures point it out, eventually, away over in Lucas county, Ohio, northwest of Toledo, and pretty close to the Michigan border. Then your smattering of Latin bobs up, and you realize that some cultured toff of long ago chose the name, Sylvania, because the settlement was in a wooded land—Sylvanus is the right word if you want to be persnicketty about it—which, perhaps, the cultured pioneer didn't know.

Sylvania wasn't much of a burg 73 years ago, and it isn't anything to write home about now. According to its own modest estimate the town has precisely 1,222 population compared with whatever it had in 1854. That was the year something happened destined to give Sylvania a place in history, or at all events in that part of the national chronicles recorded from month to month in these imperishable pages.

Seven presidents of the United States, Grant, Hayes, Garfield, Harrison, McKinley, Taft and Harding, and three vice presidents, Hendricks, Fairbanks, and Dawes, were born in Ohio. Even Virginia, one of the foundation states of the republic, produced only one more president than this, and only two vice presidents, Thomas Jefferson and John Tyler. Great names, sure, but when Viriginia was making presidents there were precious few stalwart citizens anywhere else fitted for that office. When it once started out after population it went ahead fast; it began making a few presidents itself, and it didn't limit its efforts to political timber. Not by any means. There were other kinds of presidents to be made.

A small boy stood, somewhat shyly, one morning in the middle 60s, outside the agent's window at Sylvania, O., listening to the click of the telegraph sounder. In his opinion the agent of the Lake Shore & Michigan Southern, was

a pretty important person. Every trainman had to see him when he pulled into town. Every citizen talked to him about freight and ticket rates. He and the postmaster were close friends. Then too, he knew what the sounder was saying, and anyone equipped with such intelligence was far above the ordinary mortals. The agent liked boys, particularly boys strong enough to hustle baggage or freight. Many agents are like that. True, our hero, as Horatio Alger would say, was only about 12 years old, but he had been born in stern surroundings where boys, and girls, too, soon learned to look out for themselves. Nowdays we call it developing initiative and efficiency, but in those days these words had not come west of Albany.

So there he stood, totally ignorant of the fact that in displaying his interest in the telegraph and determining to learn what made it go he was providing the material for this Little Story of March, 1928, verily the turning point in a life! "Yes, sir," said the boy, as the agent put on his best help-me-with-the-baggage smile, "I'd sure like to learn how to be an operator, and I'm sure willing to help with things."

"All right, son," said the agent —why will some men persist in calling other men's children theirs?—"the first thing to learn about telegraphy is to haul in those boxes of freight and then clean the switch lamps and clean out the waiting room. When you're resting come in here and if I have time I'll show you how to make 'A'. dot and dash, remember."

Roustabout, that's what the boy became, but nothing could keep him from learning to be an operator. He hoped and dreamed of being an agent some day. Then, if all went well, it was just within the bounds of possibility that he might actually be division superintendent, O, very far in the future of course, but still he might. Stranger things had happened and would continue to happen, world without end. Why, for that matter, a few hundred miles east of Sylvania, in New York state, another little boy, three years his junior was just starting to school, not imagining of course, that in the years to come he was to have a very important influence on this little chap's future life. You never can tell. Anyway, one certainly has a right to hope and dream. Life would be rather dreary, wouldn't it, without dreams?

Chairman Byram of the Newly Organized Milwaukee Appears to Be Thinking Pleasant Thoughts As He Signs the Minutes of An Important Meeting. Mark Potter, Seated Behind Him, Doesn't Seem Quite So Happy, Thinking About the Vanished Potter Plan, Perhaps. Standing, Beginning At the Left: E. J. Brundage, One of the Former Receivers; R. M. Shaw, H. A. Lundahl and Robert T. Swaine, Attorneys. P & A Photo.

In great political gatherings where puffy, red-faced men rise to nominate someone for something or other they talk for an hour about "the man who—" until everyone's nerves are ragged. We aren't going to do anything of the kind here. The boy who started in the humble manner we have described so imperfectly was J. A. Edson. The "J" stands for Job, a mighty significant name by the way, although it isn't pronounced the way it is spelled, the name of a patient man much given to tolerance for other's frailties and failures. And now we go on with the story.

About a year after Job began acquiring the rudiments of telegraphy what did the railroad company do but promote the agent at Sylvania to the honored post of roadmaster, or as they called that official in those faraway days, trackmaster, and whatever an agent could know about track

work, tamping ties, joint ahead and center back, passes our poor understanding. Well, anyway, they made him trackmaster, and put little Job in his place as operator—July 4, three rousing cheers—1867, and they paid him $25 a month, and nothing was taken out for hospital or union dues, there being neither of those glorious privileges in those times. Six months later, seeing the boy had brains and knew how to use them, the company sent Job to Stryker, O., as day operator and raised his pay to $40 a month, and about the same time he began to look around for empty nail kegs to pile away his wealth.

Four months at Stryker, and the boy was sent to a new yard office at Toledo. Six months there, and on he went to the general office where the dispatchers were concealed, the office where all the telegraph business was relayed between Chicago and Cleveland, a mighty important job in which the youngster stayed for several years.

Association with older men, rapid promotion, oodles of money, went to the boy's head. He began to grow a little sassy, the record shows, so they gave him a 30-day vacation without pay, and what do you think of that? Many years afterward Mr. Edson told the story and smiled the smile that had been his great asset all through life.

"That was in 1871, the year of the Chicago fire," said he. "On my way to Omaha I found myself in Chicago, broke and hungry. I got acquainted with another operator who was out of a job, but who always had a toothpick in his mouth and looked rather well fed, and I asked him how he did it. As a consequence of the information he imparted to me, I went around to one of the churches which was taking care of the refugees from the great fire, and registered as a sufferer along with the others, so that I was fed pretty well for four or five days by those good people, who never knew what real philanthropy they were dispensing to me. Finally I got a pass on the Rock Island from their superintendent of telegraph, and that is how I got to Omaha.

"The next spring, in 1872, I got laid off as operator at Toledo, and again made my way to Omaha with the intention of locating permanently."

And there he did settle down. Previously to this time, like many another youngster, he had been engaged principally in settling up. He stayed with the Union Pacific until finally in the fullness of time, which wasn't so very long, they did things early in life when railroads were not so adequately regulated, he became night dispatcher at Evanston, Wyoming, then chief dispatcher at Laramie, succeeding Edward Dickinson who became superintendent. This was the Dickinson who, years after, became president of the Kansas City, Mexico & Orient Ry.

Job Edson was only 18 when he became dispatcher at Evanston and only 20 when he became a chief, convincing proof of rather unusual ability even in those days, and wholly impossible now because of laws and what not. Incidentally, dispatchers worked 12-hour tricks in those days.

Telling about his experiences one day, Mr. Edson said, "When I became chief inspector at Laramie, Ed. Calvin, now vice president of the Union Pacific, was day operator at a place called Carbon. In the spring of 1880 I went back to Omaha on a little vacation, and while there was asked to take charge of transportation on the Utah Northern, which the Union Pacific had bought from the Mormons. I accepted the job and moved to Logan, Utah, having, in the meantime, been married in Chicago on November 10, 1880. We lived at Omaha until the Utah Northern appointment became effective.

"I had an understanding with those who offered me the job that I would be permitted to take with me a dispatching force of my own choosing, and I accordingly selected M. A. Elliott, who was located at Omaha, Mr. Calvin and Fred Rawlins, now deceased, who many years later was superintendent of transportation of the Kansas City Southern. My title was chief dispatcher, but I had entire charge of transportation matters."

In the libraries of most editors there is a big red volume filled with the names of 26,000 men and women selected from a hundred million or so because they have contributed something worth while to American life and letters, "Who's Who in America." If you look at the bottom of the third column of Page 648 in this book, you will find these words:

> **EDSON**, Job Adolphus, ry. pres; b. Sylvania, Lucas Co., O., Feb. 14, 1854; s. Charles and Mary E. E.; pub. sch. edn.; m. Margaret Gilroy, of Laramie, Wyo., Nov. 1880. Telegraph operator L. S. & M. S. Ry., 1867-72; operator, train dispatcher, chief dispatcher, and train master, U. P. Ry., 1872-1886; chief dispatcher I. & D. div., C., M. & St. P. Ry., 1886-87; div. supt. Mo. Pa. Ry., Atchison, Kan., 1887-89; supt., gen. supt., gen. mgr. and v. p., Tex. div. Cotton Belt Rd.; 1889-99; gen mgr. for receivers, Kansas City, Pittsburgh & Gulf R. R., 1899-1903; mgr. D. & R. G. and R. G. Western rys., 1903-04; gen. mgr., C. H. & D. Ry., 1904-05; elected pres. Kansas City Southern Ry. Co., June 1, 1905; federal mgr. Kansas City, Mexico & Orient R. R., K. C. S. R. R., Midland Valley R. R., June 1918-Feb. 29, 1920; pres. K. C. S. Ry. Co. since 1920; also pres. Tex. & Ft. Smith Ry. Co.: v. p. Ark. Western Ry. Co. Home: Sophian Plaza. Office: Kansas City Southern Bldg., Kansas City, Mo.

So you see, the little chap who learned telegraphy at Sylvania in the 60s became president of the Kansas City Southern Railway built—well, for goodness sake—by the other little boy who started dutifully if reluctantly to school, as set forth far back in this rambling tale, Arthur Stilwell was and is his name.

One more word, as the minister so recklessly announces, and we are through; one more line remains to be added, and properly it belongs on page 648 of Who's Who:

> Retired, January 1, 1928.

Perseverance is failing nineteen times and succeeding the twentieth. —The Rev. Dr. John Andrews.

Someone Once Said A Farmer Would Buy Anything He Could Ride, and Negro Freight Handlers Are Equally Enthusiastic Over These Mercury Trackless Trains.

Trackless Trains Cut the Cost

Freight Handling De Luxe

By W. H. Compton

THE freight platform at Ninth and Broadway, Louisville, is now declared to be not only one of the longest in the world under one roof, but is said by the Louisville & Nashville Ry., to be also one of the most economically and efficiently operated. Naturally, when such an assertion is made, in railroad circles, the air is charged with inquiry, which is euphemistically expressed by Southerners in the colloquialism of the region as "how come?"

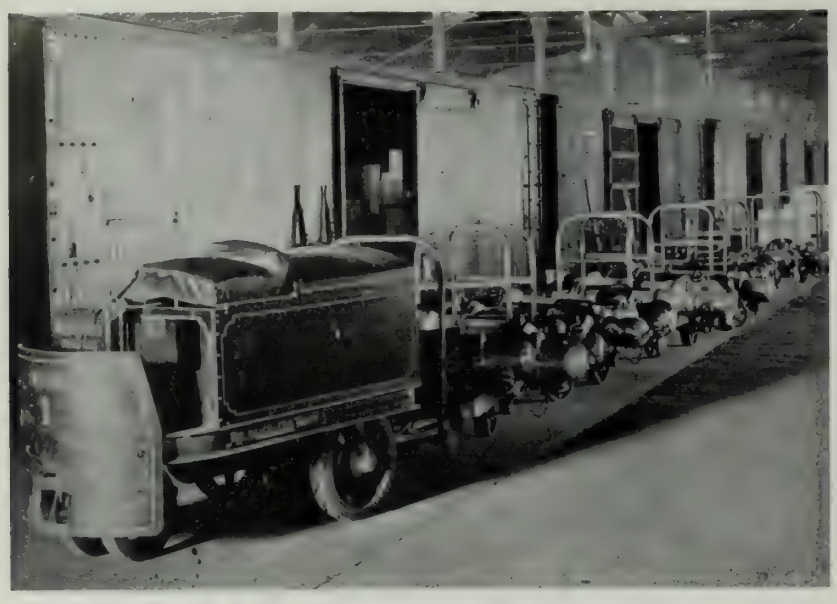
"The trackless train did it," say the loyal employes of the Louisville & Nashville freight department, and this, it is explained, is the tractor-trailer method of handling freight, one of the new trains being shown in accompanying illustrations supplied by the company's magazine.

The new system was devised and manufactured by the Mercury Mfg. Co., of Chicago. As a result of the adoption of this scheme of freight handling the former congestion of freight about the doors and on the long platforms is eliminated, all freight is dispatched the same day it is received at the warehouse, and is handled at the warehouse, the freight department says, at a cost very much below the former figures developed by hand trucking.

But in addition to all of that a very substantial improvement in service to shippers is occasioned by this most modern system of freight handling.

Heretofore it was necessary for shippers' drays and trucks to deposit l. c. l. freight at several doors of the warehouse, the number of doors to be visited depending upon the number of destinations of the various packages of freight loaded in the truck or wagon. By the new method all freight delivered to the platform by city shippers is unloaded from their trucks and wagons to the four-wheel trailers at one designated door.

However, before the truck driver knows where he is to unload his freight, he takes his bills of lading to a locater, stationed at the head end of the platform, who marks on the shipping orders the car spot numbers for the different shipments on the shipper's truck. The locater then tells the truck driver at which door his freight should be unloaded. The doors are numbered from 1 to 44. The truck driver, with the assistance of a company employe known as a break out, unloads his freight onto four wheel trailers. Only freight for one box car is placed on a trailer. If the shipper's truck contains freight for five different freight cars it is handled by at least five separate trailers to those cars. Each trailer when completely loaded is marked for its destination car with a ballot, the ballot showing the total number of pieces in the shipment, the total number of pieces loaded on the individual trailer, the car spot number and the initials of the receiving clerk. The tractor crews pick up all trailers which show a ballot in the



The Louisville & Nashville Has Four of These Speedy, Labor-Saving Tractor Trains at Memphis Now.

rack. The trailers are made up in train order so that the first trailer picked up is the last dropped off. The trailers are dropped off at the proper cars for the stower to take into the cars and unload.

More Air Passenger Service

Charles V. Eakin, president and general manager of the West Coast Air Transport Co., which started airplane passenger service to Seattle and Portland March 5, has placed an order for a 22-passenger monoplane with the Bach construction plant at Santa Monica. The plane will be of cabin type with buffet and other modern innovations and delivery has been promised for July 1, Eakin said.

He did not reveal the price to be paid for the plane or on what end of the projected Los Angeles-San Francisco-Portland-Seattle line it will be used, but it is believed it will go into service between Los Angeles and San Francisco.

New Gas Electric Power

Completion by the White Company of what it declares is the most powerful gas electric motor bus thus far produced by the industry has made it possible for street railway and bus companies to extend the use of this equipment to areas heretofore beyond the performance range of the gas electric, without any addition in cost over the types now confined to limited city service.

The White six cylinder 100 horsepower engine in wide use throughout the country on a chassis for high speed, deluxe motor bus service has been modified and fitted in a new chassis for the gas electric service. Electrical equipment was developed in conjunction with the General Electric Co. the big six cylinder power plant making possible the use of larger and more powerful electrical equipment than has ever been installed in a motor bus chassis.

A New Oil-Electric Car

A new oil-electric rail car is announced by the Westinghouse Electric & Mfg. Co., in conjunction with the Canadian National Rys. This is a 73-foot baggage and passenger car built in Canada, equipped with a Westinghouse power unit, including a 300 horse power six-cylinder Westinghouse-Beardmore oil engine, with the electrical equipment including generators and driving motors produced by the East Pittsburgh works.

The oil engine is now being manufactured at the South Philadelphia works of the Westinghouse Company. The oil engine with the flywheel and bedplate has a combined weight of about 10,000 pounds. The fuel oil is delivered to the engine from a 150 gallon tank, which normally gives the car a minimum operating radius of 450 miles. The engine from the stage of idling is capable of a complete range of speeds up to a maximum of 60 miles an hour at a maximum output of 300 horse power at 800 revolutions a minute. The engine itself is one of the first successful high-speed oil engines, combining light weight and high thermal efficiency, so necessary in a prime mover for the self-propelled rail car.

The car, as designed for the particular requirements of the Canadian National Railways, is divided into four compartments providing space for baggage, general passenger accommodations and a smoking room, as well as a 16 foot engine room. There are seats for 57 passengers, so arranged that three can sit on one side and two on the other side of the car.

The Canadian National Railways are operating 14 of these cars. The first one was placed in service in September, 1925, and the total mileage in actual service to date on all cars is approximately 800,000 miles. Their announced operating record, making a comparison between the cost of operating this type of car and steam trains in similar service by selecting two cars aggregating 700 miles a day, show the representative steam-train cost as $1.01 a train mile. On the other hand, the cost of the oil-electric car superseding the steam train was $0.28 a train mile, showing a saving of $0.73 a train mile. The two oil-electric cars replaced four steam locomotives.

When you start to criticize consider how well you could have done the job yourself.

What Brains and Money Have Done

In the Chicago Coliseum

By H. A. Smith

A. L. GREENABAUM, O. F. JORDAN CO.,

TO THE writer who has attended the exhibits of the National Railway Appliances Association since the first one in 1908 in the Coliseum when there were only ten or fifteen exhibitors with a small show at the Auditorium hotel, every new show put on by this organization gives a thrill. Year by year it points out the phenomenal advance in the march of progress in transportation.

We hear of arguments in Washington, dreary sessions in which men try to convince others that their view of the immigration question is right and everyone else's viewpoint wrong; talk by the hour, by the day, about the effect of restricted immigration on track work in the West and Southwest. But when a man walks through such a show as this in Chicago's Coliseum it doesn't take long to see that brains and money are working together toward another solution of the problem. Brains and money—a great force.

C. W. KELLY

If you lived in that era and knew the railroads when construction work was pretty much a matter of brawn; when the section work was done chiefly by Irish philosophers with clay pipes, when there was no problem about the admission of Mexicans into the country, and the housing and schooling question didn't exist; when the men who are now roadmasters and engineers pumped their cars out in the morning and pumped them home at night, you're going to hesitate before an exhibit such as that of Fairmont and marvel at the latest motor cars with their shining paint, their economical power plants, and sturdy construction, rivaling in comfort, looks and economy the latest developments in automobiles.

You wouldn't even have to be a railroad man if you are only old enough to have traveled in the times which men still young refer to as the early days, and remember the gangs of men working along the track with shovels, digging the ditches and shaping the ballast, to appreciate the latest Jordan Spreader that can be used for ditching, spreading bulky material or plowing snow.

And you don't even have to go back very far or strain your gray matter very severely to appreciate the progress being made nowdays in equipment intended to reduce

P.H. GILLILAND
FAIRBANKS-MORSE
& COMPANY

your labor costs and speed up maintenance and construction work, when you see the new self-propelled compressor being introduced by the Chicago Pneumatic Tool Co. Of course you listen when you are told these machines are made in four sizes with capacity ranging from 100 to 310 cubic feet per minute displacement, and weigh from 6,350 lbs. to 10,700 lbs. But the thing you're thinking about is how the portable features will assist you in your track, bridge and building departments; a machine with a powerful enough chain drive to propel itself at a speed of from 12 to 18 miles an hour, and still so designed and equipped with roller bearings that you can push it along a level track with one hand.

You may not have railroaded in days of the high ball signal nor be able to remember how great was the annoyance and expense involved when you constantly had to send out men to put up new bumping posts because some brakeman with no appreciation of the car, the lading or the bumping posts' weakness wrecked them. But if you are red-blooded and not too hard boiled you surely should see real industrial romance in a show such as this. Of course if you have never seen a gang go out in the morning on the old hand car; if you don't know anything about the shock that shoulders feel in tamping ties with the handle of a shovel; if you can't remember what a job it was to saw or drill a hole in a steel rail in the years gone by; if you never drove spikes in a tie with an old style maul or never tried to apply one of the first rail anchors—then perhaps this show is wasted on you.

CLYDE P. ROSS,
ROBERTS & SCHAEFER

But almost every day and every year brains are developing new ideas, new devices to speed up construction work, to make it more economical and to take out the blisters and the backaches. Every year this show at the Coliseum is the open door, the vision forward, the incentive for greater developments. This year alone it is said there were 700 devices shown by 188 manufacturers, and that of this number 160 devices were new and being shown for the first time.

J. L. ROWE,
CHICAGO PNEUMATIC
TOOL COMPANY

And still one man asked me,—Do you thing it pays? I leave it to you—do you think it pays? Pays! I don't know whom he means; pays the exhibitor or pays the railroad. There is one sure thing we do know; it doesn't pay to miss it.

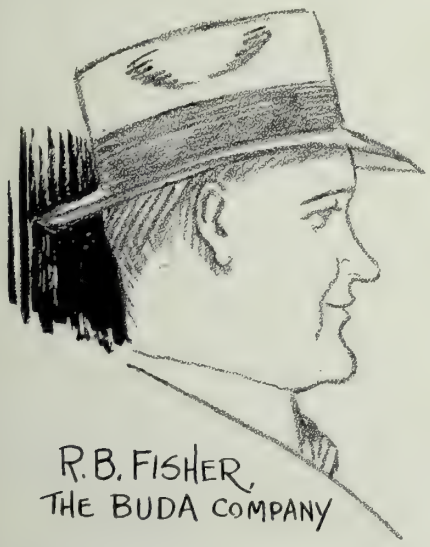
However, from the ever-increasing attendance and the interest

J. WILL JOHNSON,
PYLE-NATIONAL CO.

W. B. TEMPLETON,
TEMPLETON-KENLEY

displayed I don't think there are many who miss it; and then again it might be rather expensive and awkward to take some of those machines and working exhibits up into the railroad man's office and give him as clear a conception of their adaptability and operation as he can get at this annual show.

The officers of the National Railway Applicances Association who have given so much of their time and energy to make this exhibit as successful as it was this year and to whom the industry are indebted are: President, L. E. Weidman, of the Frog, Switch & Mfg. Co.; vice president, A. L. Greenabaum, of the O. F. Jordan Co., and secretary and treasurer, C.



W. Kelly. The directors are W. B. Murray, Miller Train Control Corpn.; F. M. Hartley, Jr., National Lead Co.; M. C. Beymer, Oxweld Railroad Service Co.; S. P. McGough, Lorain Steel Co.; A. S. Anderson, Adams & Westlake Co.; J. W. Fogg, MacLean-Fogg Nut Co., and B. L. Winchell, Jr., Kerite Insulated Wire & Cable Co.

A. L. Greenabaum, vice president of the O. F. Jordan Co., East Chicago, Ind., was elected president of the National Railway Appliances Association. The other officers elected were: Vice president, S. P. McGough, Lorain Steel Co., Johnstown, Pa., and secretary-treasurer, C. W. Kelly (re-elected). The directors elected were: M. C. Beymer, Oxweld Railroad Service Co., Chicago (one year to fill the unexpired term of S. P. McGough); W. H. Fenley, Kerite Insulated Wire & Cable Co., New York (two years to fill the unexpired term of B. L. Winchell, Jr.); J. T. McGarry, American Valve & Meter Co., Cincinnati (three years); and H. F. McDermott, Wm. Wharton, Jr., & Co., Inc., Chicago (three years). The election comprised a unanimous approval of nominations submitted by a committee consisting of W. B. Murray, Miller Train Control Corpn.; A. J. Filkins, Paul Dickinson Co.; and E. H. Bell, Railroad Supply Co.

Evidence of the sound financial condition of the association was shown in the report of Secretary-Treasurer Kelly, who stated the estimated balance of income over expenses for the exhibit now in progress would be between $1500 and $2000. This is to be compared with a net gain of $2,159.32 for 1926-27 and a deficit of $6,981.17 for 1925-26.

These Dogs Saved a Man

To his two dogs, stopping an approaching train when he fell unconscious on a railroad track near Wadena, Iowa, recently, G. P. Clark believes he owes his life. With their master lying between the rails, Treve, a Scotch collie, took his place beside the body and Freckles, a coach dog, ran barking down the track to meet the train. The fireman noticed that something was wrong and the train was stopped.

The coach dog was found on the pilot of the engine, fighting and barking, and the collie was barking loudly from his position beside his master.

Help for the Weary Traveler

When a traveler enters the average railroad station in a large city, a union station where most of the population seems to be swirling around and no one, apparently, cares two hoots whether he finds

his train in time enough or just in time to be too late, it isn't a great deal of help when someone directs him to a large blackboard, usually too high for his eyes, or too confusing for any except the experienced to understand. For just such a situation comes the Hutchinson Train Indicator, an indicator anyone with eyes can comprehend without anyone explaining it.

In this new indicator one panel gives the name of the train, the time at which it leaves, the number of the track, and if run in sections the section number. An adjoining panel gives the Pullman car numbers in the order in which the train is made up.

Train Took the Long Count

An automobile and a freight train, egged on by a high wind, went at each other tin and nail near Santa Rosa, Cal., and the freight train lost. The auto, a bakery truck, was only dented but the freight train lost a truck and traffic was held up for hours.

The driver of the auto said the wind, which was registered as high as 51 miles an hour, pushed him into the train, although he set all the brakes.

Here's A Combination Bus for Passengers, Baggage and Express, Now Used in the South.

A Passenger Baggage Express Bus

A new type of bus operation was recently installed between Fort Valley and Perry, Ga., a distance of 12½ miles, by the Central of Georgia Transport Co., a subsidiary of the Central of Georgia Ry. The bus replaces a steam service of 54 years' standing.

The bus not only provides for passenger traffic, but has a locked compartment for baggage, mail and express. It is a Mack unit, built to the specifications of the rail company, and is looked upon as the ultimate in design for this type of service. Seats for 15 persons are provided in the forward end of standard bus shell while the rear five feet of the body is given over to the auxiliary service.

Between the compartment and the passenger section is a solid wood and glass partition, thus providing safety in transit for the baggage, mail and express. Access to the compartment is had through a door 5 by 4 feet, built into the rear of the bus. This door is fastened by a self-battening wedge-bolt at the top and bottom which is controlled by a locking lever at the center. It is padlocked for security.

The floor of the bus is at a level with express trucks and platform heights, and is metal covered with a slat flooring to permit protection against drainage of refrigerated goods.

The four walls of the compartment are covered with a heavy wire mesh, which provides protection against wall and window damage. This mesh is secured to the walls by a system of small clamps.

It is a complete unit, capable of carrying all of the traffic of the passenger service which was replaced, at about one-fifth of the cost of steam service. It is foreseen that this type of bus will become very popular in short line light traffic service, replacing the worn-out equipment of the steam service with a fast, modern, economical, unit which closely meets the public demand for the "ride on rubber" and which at the same time permits service to be conducted at a profit.

The bus has the stamp of approval of the inspecting mail and express officials, and has met with great favor on the part of the riding public. The officials of the company are more than pleased with its appearance, performance and economy.

Watt and the Kettle

The popular belief that Watt was led to invent the steam engine by observing the effect of steam on the kettle lid was described as a myth by Prof. E. N. de C. Andrade in a lecture recently to children on "Engines,, at the Royal Institution, London.

Actually, he said, Watt, as an instrument maker, was asked to repair the model of a Newcomen engine and by his examination of this he was led to design a more efficient and economic steam engine, in which steam, having been expanded to low pressure in other parts of the engine, did work by virtue of the partial vacuum created by a condenser. It was that principle which was applied in every economical reciprocating or turbine engine of today.

What Mr. Gibbons Really Said

John M. Gibbons, general attorney for the New Haven System, says the newspapers misquoted him in reporting his address before the Bankers' Club of New York in October. Mr. Gibbons was quoted as saying that "since the prohibition law was enacted railroad accidents had increased about 40 per cent." It appears that several qualifying words were left out of this sentence. Writing about this recently, Mr. Gibbons says:

"My contention was that since prohibition there had been an increase of about 40 per cent in industrial accidents 'in the state of New York.' The figures of our industrial commission indicate that 345,672 accidents were reported for the fiscal year ended June 30, 1920, while during the 12 months ended June 30, 1927, the total was 518,297, an increase of more than 49 per cent."

Rule of Common Prudence

The rule laid down by the court is simply the rule of common prudence. In effect, it warns motorists that if they are hit by a railway train the fault is likely to be theirs.—Indianapolis News.

The American-Hawaiian Steamship Mexican.

Avoiding Claims in Water Transport

Hints to Shipper and Carrier

By R. H. K. Smith

American-Hawaiian S. S. Co.

RAIL and water freighting are so totally dissimilar in all methods of operation, particularly insofar as the intercoastal trade is concerned, that it is difficult to write an article that will cover both features so as to combine them as a whole. Documentation, handling, schedules, stowage, etc. are so totally at variance that this article will deal with freighting by water only.

Let us presume that a big shipper wishes to send his goods from the Port of New York to Los Angeles harbor. His first thought is a rate question, and on this he is too often tempted by the cheapest, whereas his investigations as to the water carrier involved should qualify a given rate by service, responsibility, schedule, handling methods, claim policy.

Service consists of the ability of the carrier to give him the documents he requires in perfect shape, covering in full detail names and addresses of himself and consignee, marks and numbers with tariff description of articles shipped, ocean freight, advance and other charges under separate headings, and exceptions, if any. The latter, particularly, is a very moot question. The average bill of lading is generally claused: "Received in apparent good order and condition" and it is part of a well organized water carrier's service to advise a shipper as to the sufficiency of the package offered for shipment. It is highly annoying to a shipper or consignee to have a defective package loaded, without having had an opportunity to recondition or replace it.

For the sake of argument, let us assume our shipper has sent a case of delicate fabrics to a dock for shipment. En route from his warehouse the package becomes wet or damaged, and is received and loaded by the water carrier with a damage notation on the bill of lading accordingly. How much better, and a real service to the shipper would it be for the receiving clerk immediately to notify the shipper, so as to give him the opportunity to replace or recondition the damaged package.

Again, let us assume that our shipper has sent a very valuable piece of marble statuary for shipment wrapped in burlap only. He certainly would appreciate it if he was courteously advised to place it in a strong wooden case, properly packed, instead of receiving a bill of lading with exception "insufficiently protected" etc. thereon, and then have it arrive with an arm or the head off.

Service by a first class organization keeps a shipper advised of

such problems. In addition, our shipper may not have given marine insurance a thought. Service immediately takes care of him in this important feature also, by reminding him that the water carrier will arrange his insurance for him, if necessary. It also informs him as to the desirability, and educates him as to the kind of insurance protection he may secure, and so on.

Our shipper's next thought should be the responsibility of the water carrier. In other words, it is much safer to ship by a concern which is financially responsible, whose word is as good as its bond, and which is dependable.

Suppose an accident is involved which may mean a large claim. Our shipper should feel perfectly at ease, that the claim will be recognized promptly and adjusted without interminable, inexcusable, annoying delays.

Responsibility of the water carrier's personnel is also a big factor, and the concern that will absolutely stand by and confirm the acts or promises of its employes is truly one to favor.

After being satisfied as to the carrier's responsibility, the next thought is schedule. Does the carrier operate and live up to its schedule? Does it sail and arrive as advertised? If it carries your goods "swiftly, carefully on schedule time," it should have consideration.

Frequency and dependability are big factors in shipping. Frequency of sailings is most desirable from a shipper's standpoint. If a package arrives for shipment just after a vessel has sailed, the shipper knows that another sailing takes place in a day or two, and is not put to the expense of moving the package to another dock to catch another vessel.

Again, frequency of service means perfect handling. Stevedores are able to keep the same men steadily employed so that they become familiar with loading and discharging methods, and are wide

The Seaman's Switch Engine.

awake to the subject of careful handling. This is a most important feature, as continual changing of men means new faces on the job, and loss of efficiency.

Handling today is almost a science, and the responsible carrier is always alert in this respect. Special boards or trays are designed for commodities that must not be squeezed, or bruised. Special slings are used for special commodities, and it is rare indeed for a reliable carrier to damage cargo during hoisting or lowering. Longshoremen's hooks are strictly forbidden except with commodities that are not damageable.

Stowage of goods is also a science. Wet goods are stowed in separate compartments, chemicals in others, odorous by themselves, and so on. The well organized carrier not only separates such commodities on the dock when receiving, but also has ship's officers in the holds to see that stowage is adequately and carefully performed, and that vicious commodities do not get mixed with perishables.

Stowage itself is worked out carefully by plan. The officers see that frail commodities are given top stowage, and keep memoranda as to location of goods in the ship so that a master stowage plan is readily prepared for the guidance of the carrier at port of discharge.

When goods are unloaded, a reliable carrier will never attempt to conceal damage to packages (if any) when delivering to the consignee. The delivery clerk's duties are to draw the attention of the consignee to any defect such as "contents rattling," etc. so that responsibility for the damage may be placed immediately.

In this manner the grief of later guesswork or argument is eliminated. A dependable carrier is willing and anxious to assume liability, if any, before receipt is given for the goods damaged, and does not wish to evade the issue. If the liability is his, he assumes the responsibility, no more, no less. Once assumed, the claim involved should be promptly liquidated without evasion. A claim is either just or unjust, and should be treated in a business like manner.

So much from the shipper's standpoint. Now from the carrier's point of view. Competition and other causes have brought about a packing condition that is indeed hard to overcome. If some shippers would realize that packing egg shells in newsprint paper parcels is not conducive to safe and sane transportation, a great deal of grief would be overcome. A great percentage of shippers do pack safely, but some, whose attention has been drawn to very frail containers have been indignant, and used a threat: "If you don't want the shipment, others do." This is a poor policy. After all, the reliable water carrier, in its policy of service, is trying to help such shipper getting his goods to destination intact. The carrier most certainly does not want claims, and it is assumed that the shipper or consignee is just as eager to sidestep the evil. The well organized water carrier today has brought his business to a state of almost scientific perfection, but cannot make it 100 per cent ef-

The McCormick Steamship Company's Fine Passenger and Freight Steamship, the West Nilus.

ficient without the cooperation of the shipper.

As a last thought, if all shippers, large and small, will see that their goods are packed in sufficient containers, properly marked in conspicuous letters and numbers showing consignees' address, there will be no need for a claims department in the organization of a frequent, fast and dependable water carrier as constituted today.

Finally, if shippers will get their goods to a dock well ahead of loading time, the stowage problems of the carrier will be greatly alleviated. It means that loading plans can be prepared with greater ease to the benefit of both goods and ship. If a load of pig iron that "must go" arrives on the dock just as the ship is finishing loading, it probably would be impossible to place it aboard as the top cargo undoubtedly would be light or frail, easily damaged by the stowage of pig iron on top or adjacent thereto.

Roller Bearing Diners for the S. P.

Roller bearings and electric dishwashing machines are outstanding innovations in $360,000 worth of new steel dining cars delivered last week to the Southern Pacific at San Francisco for service in two of the company's crack trains, the Overland Limited and the "Cascade."

The six new 77-foot diners, constructed at a cost of $60,000 each, are said to be outstanding examples of the carbuilders' art, and are the first cars equipped with roller bearings to be built for a Pacific Coast railroad.

The cars are finished throughout in Cuban mahogany and decorated with a color scheme of California poppies and gold striping against cream backgrounds.

An electrical dishwashing machine, which first washes silver and crockery in boiling water and then sterilizes them with live steam, is a built-in feature of the new cars. It is the first automatic dishwasher to be provided as stock equipment on a dining car, and is the result of long experiment by the company's commissary department.

Each car will be furnished with nearly 5,000 pieces of linen made to order in Ireland; 31 varieties of chinaware, including 172 cups and saucers and 334 plates and platters in addition to other china, and 837 articles of silverware.

Like the good five-cent cigar, courtesy is much needed. The railroads most of all need it, especially on their trains.

Courtesy As An Asset

C. L. Holland

Courtesy may aptly be compared with making love to a widow, or practicing safety—it is scarcely possible to overdo it. The saying that competition is the life of business should be changed to read: Courtesy and competition are the life of business. Whether applied to railroads, steamship or bus lines, or in fact any business, the life and success of that business depend to a large extent upon the courtesy of the employes.

In a small town not long ago I saw a sign in the railroad station. It read:

"There are two places you'll find courtesy. In the dictionary and this station."

The most gratifying thing about this sign was that the station agent and his force actually practised what they preached. It is needless to add that this station received much favorable comment from the traveling and shipping public, and from the offiicals of the road.

Another agent improved on a well known sign and it now reads as follows: Freight rates quoted. Bills of lading issued. **Information Cheerfully furnished.**

You and I invaribly patronize a business where we receive courteous treatment. If we aren't treated courteously we seldom go back.

One cigar store capitalized on courtesy to such an extent that in a city of about 300,000 people, it ranks foremost among the other stores. The quality of the products handled is no better than the other stores, and prices are no lower. The company's slogan is: "Your purchase costs you nothing if we fail to say thank you." This store so far, has collected for everything sold.

So far-reaching have been the results of courtesy that the gospel of it is spreading to every line, and railroads as well as other business institutions are placing particular stress on the word, and are careful to see that it is used in their advertisements and on their literature.

The hotels of this country were pioneers in making courtesy pay. Taken as a whole it is evident that the courtesy one receives in larger hotels, and in practically all of the smaller ones, is much greater than in other lines of business, and the success of many could be traced directly to the habit of courtesy.

A New Wind Shield for Rail Motor Car.

Many employes practise courtesy as a habit, and are naturally courteous; others practice it for what it is worth in tips. The fact that the most courteous employes, whether waiters, bell boys, porters or messengers, receive the greatest number of tips is conclusive evidence that courtesy is an asset, and that the public is willing to pay well for courtesy even though it is entitled to it gratis.

The telephone girls with their inevitable "Thank you" should, and it is reasonable to believe they do reform many grouchy and discourteous persons. Their courtesy is contagious.

It is not a rare thing to read in the papers that some wealthy man or woman has died and left sums to obscure and unknown persons who were courteous at some time, often many years previously, all of which goes to show that courtesy is not forgotten.

The most remarkable thing about courtesy is that it costs nothing and it pays such handsome dividends, not only in money, but in friendship. To this one might add that the person who is courteous derives considerable satisfaction.

A New Windshield Equipped Inspection Car

The latest addition to the line of motor cars manufactured by Mudge & Co., Chicago, is known as the Class B-3 Inspector. It was especially designed as an inspection car which can be handled by one man, if necessary, but having sufficient power, seating capacity and deck space to carry four men with their tools or baggage.

One of the new developments in accessories for this car is the new Mudge windshield. This consists of a strong steel pipe frame covered with brown waterproof canvas over the lower portion and framing an amber colored celluloid window of ample size to permit clear vision. This windshield attaches to the safety railing, is of substantial construction, light in weight and quickly and easily attached. It offers a high degree of comfort to the operators of the car in cold weather without introducing an accident hazard. This windshield is also applicable to the Mudge C-1 centerlight car.

A race between a motor and a locomotive with a grade crossing as the goal may possess its elements of excitement, but it is not conducive to longevity and the practice should be discouraged, even though arrest may be necessary in order to drive common sense into foolish people—Trenton (N. J.) Gazette.

A French concern will start air mail service between Uruguay, Brazil, Africa and Europe, one trip weekly being made at first.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

THE Moffat tunnel was opened formally Sunday, February 26. Twenty-five hundred persons, in a special train of four sections, made the trip from Denver to the east portal of the tunnel to witness the historic event, to hear speeches commending the work of men who made the tunnel possible, and to witness the governor and an ex-governor of Colorado drive a golden spike into a tie just at the eastern mouth of the tunnel.

Following dedicatory ceremonies and speeches at the east portal the trains were formed into two sections which steamed through the tunnel—the first passenger trains to go through it under the Continental Divide. Gov. Adams of Colorado and ex-Gov. Shoup drove the gold spike into the tie amid cheers that made the snow-covered slopes of the mountains ring. Short addresses were made by Mr. Shoup and Gov. Adams. Mayor Bowman of Salt Lake City, representing Gov. Dern of Utah, made a speech in which he told of the interest of the people of Utah in the completion of the tunnel.

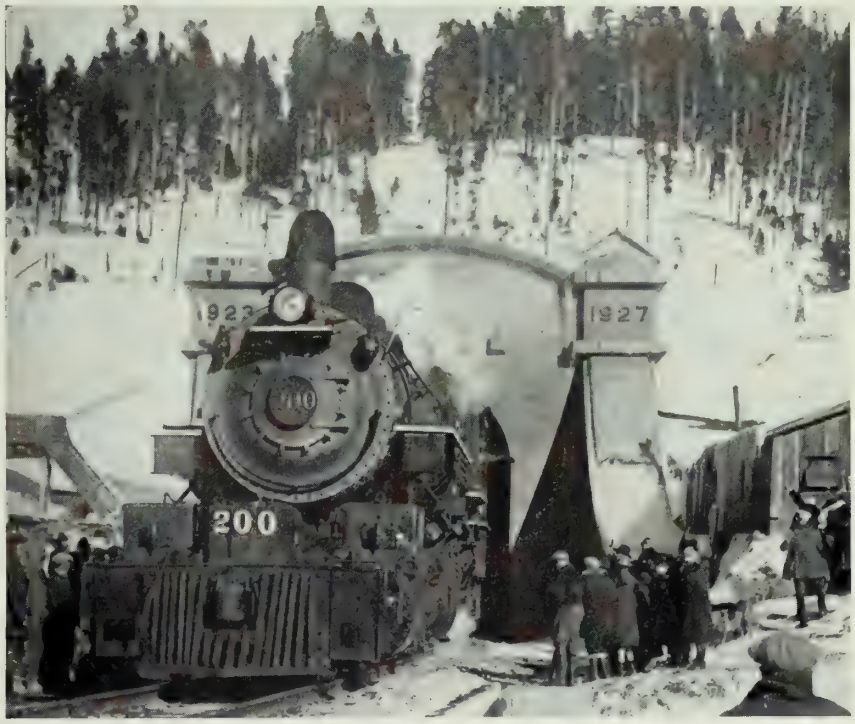
W. P. Robinson, head of the Moffat Tunnel Commission, formally transferred the possession of the tunnel to the Denver & Salt Lake Railroad. W. R. Freeman, president of the railroad, accepted on behalf of his company.

The tunnel, six and two-tenths miles long, is the longest railroad bore in the North American continent. It will cut off 27 miles of travel over the Continental Divide, and the road when completed to Salt Lake City will cut the distance between Denver and the Pacific Coast by 181 miles.

Coloradoans declared that its completion opens up a hitherto inaccessible inland empire as large as Pennsylvania.

The tunnel property, which consists of two bores, one carrying the railroad and the other water for the city of Denver and other purposes, belongs to a local improvement district embracing four counties and parts of five others.

Its early history includes a long series of attempts to utilize state and city credit for the project, with ensuing litigation ending only in the United States Supreme Court. Its total cost has been approximately $15,000,000, including interest on bonds during construction, the improvement district having issued its bonds in a similar amount.



First Passenger Train Through the Moffat Tunnel February 26 Carrying Distinguished Guests for Formal Ceremonies.

From the beginning the "Moffat Road," as it always has been and still is called, has been closely connected with the tunnel project. Actual construction of the railroad, now known as the Denver & Salt Lake, began with opening of the present century, but the ambition to see Denver directly connected with Salt Lake City and the Pacific Coast existed among its citizens for a quarter of a century before that.

The building of the D. & S. L. was David Moffat's great adventure in life. He poured his personal fortune into it, fighting against the determined opposition of great railroad interests and hoping always that he would live to see it not only completed, but successful. He died in March, 1911, at a time when his project had become involved in financial difficulties from which his utmost efforts failed to extricate it.

After various temporary expedients on the part of Moffat's executors had failed, the railroad went into receivership in May, 1912. Nevertheless, in December of the same year the contract was let for extension of the road 42 miles to Craig, its present terminus. In May, 1913, the property was reorganized as the Denver & Salt Lake Railway.

It was at this time that eastern financiers, including Frederick H. Prince of Boston and New York, took an interest in the property and contributed largely to its financial rehabilitation. But the project was still not beyond the stage of pioneering in the wilderness and in 1917 the railroad again passed into the hands of receivers, who remained in charge of it until early in 1927.

In June, 1923, all legal obstacles to the launching of the tunnel as a public project were overcome and in the same month the first bond issue of $6,700,000 was sold to R. M. Grant & Co. of New York. The progress of construction, considering all the difficulties encountered, was rapid and in 1927, with completion of the work approaching, a lease of the railroad bore to the Denver & Salt Lake was executed in accordance with D. H. Moffat's original conception of the scheme.

The first freight train to go through the tunnel was sent through the bore by the Denver & Salt Lake February 16. It was a test train consisting of 55 cars, with two Mallet type locomotives to settle the ballast, and was not intended regular service. The ventilating sys-

tem previously had been tested out and was found to be working perfectly.

The train entered the tunnel from the west portal and was equivalent to two regular freight trains in tonnage; it made the journey of 6.4 miles in 45 minutes. The saving in time, compared with the haul over the top of the divide, was between eight and nine hours. In passenger service the saving will be three hours.

Meetings of Electric Railway Association

March 13-15—Oklahoma Utilities Association, annual convention, Tulsa.

March 14-15—Illinois Electric Railway Association, Springfield, Ill.

March 21-22—Central Electric Traffic Association, Seelbach Hotel, Louisville, Ky.

March 23—Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.

March 30—Executive committee American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

Central Electric Accountants Meet

The Central Electric Railway Accountants' Association which held its annual convention February 17-18 at Cincinnati selected Detroit for the next place of meeting, and set July 27-28 as the date. Forty or more members attended. These officers were elected:

President, F. A. Healy, auditor and treasurer Indiana, Columbus & Eastern Traction Company, Springfield, Ohio.

First vice president, H. F. McColgin, auditor Interstate Public Service Company, Indianapolis, Ind.

Second vice president, C. E. Baker, auditor Lima Toledo Railroad, Lima, Ohio.

Secretary, L. E. Earlywine, Indianapolis, Ind.

Executive committee— Terms expiring in 1929: J. B. Hooper, Detroit, Mich., and L. J. Wetzler, Chicago, Ill. Terms expiring in 1928: O. A. Small, South Bend, Ind., and A. E. Wafer, Akron, Ohio.

New Way to Stop Accidents

Every operator of a car or bus who gets through the month without an accident will receive a bonus of $5 from the Houston Electric Company of Houston, Tex. It is believed by the company and hoped by the men that the 460 employes in this department will receive about $25,000 this year through the proposed bonus payments. Accidents decreased 12½ per cent on this company's records in 1927 compared with 1926. Of course accidents for which operators are not responsible will not be charged against them.

Pickwick Stage Buys Purple Swan Interests

Pickwick Corporation, to further its plans for a transcontinental stage line from Los Angeles to New York City, has purchased a controlling interest in the Purple Swan stages operating between Kansas City, Chicago and Indianapolis. The purchase was accomplished through the recent formation of the Pickwick Greyhound Co., which was brought about by a consolidation of the Pickwick and Greyhound companies. The Pacific Corporation and the Motor Transit Management Company own 50 per cent each of the stock of the Pickwick Greyhound Co., which in turn owns 51 per cent of the stock of the Purple Swan stages. This follows the recent announcement of the acquisition by Pickwick Corporation of the White Lee Company Stage Lines, operating in Oklahoma and Texas. Charles F. Wren, now in New York City, is understood to be working on plans to complete the remaining links of the eastern chain.

In spite of the great expansion of the company, net earnings for the year are expected to be greater than the previous year, Thomas Morgan, vice president, says. The first motor stage sleeping coach has been planned by the company, which will supplement the observation-buffet car that has been operating successfully for the past two years.

The Pickwick companies are not associated with the newly formed West Coast Airways Co., according to Mr. Morgan, although some of the Pickwick stockholders hold an interest in the company.

Railways Spent 771 Millions in 1927

Capital expenditures of the Class I railroads in 1927, made for new equipment and for additions and betterments to property used in connection with the transportation service, amounted to $771,552,000, according to complete reports for the year received by the bureau of railway economics. Compared with the preceding year, capital expenditures in 1927 showed a decrease of $113,534,000 or 12.8 per cent.

Capital expenditures for new equipment in 1927 amounted to $288,700,000, a decrease of $83,222,000 or 22.4 per cent compared with 1926. Expenditures for locomotives in 1927 amounted to $76,975,000 compared with $108,263,000 in the preceding year, while for freight trains cars $136,490,000 was expended during the past year compared with $185,792,000 in 1926. Capital expended for passenger train cars in 1927 totaled $53,769,000 compared with $58,117,000 the preceding year.

For roadway and structures, capital expenditures amounted to $482,852,000, a reduction of $30,312,000 or 6.3 per cent below 1926. Of such expenditures, those for additional track in 1927 totaled $139,175,000 compared with $166,758,000 in the year before. For heavier rail, expenditures totaled $43,742,000 or an increase of $1,558,000 above 1926 while for additional ballast, $16,230,332 were spent in 1927, which was slightly under similar expenditures in the preceding 12 months. For shops and enginehouses, including machinery and tools, reports showed capital expenditures amounting to $35,236,000 compared with $46,882,000 the year before while for all other improvements, $248,468,000 were expended, which was an increase of $7,649,000 over the corresponding period of the preceding year.

Short Lines to Meet in Mexico City

The American Short Line Railway Association is to hold its next convention May 10 in the Bank of Mexico Building, City of Mexico. Bird M. Robinson, president of the association is now in Mexico arranging the details.

President Calles asked Mexican Ambassador Manuel Tellez to issue a formal invitation to the association to hold its meeting in the Mexican capital. Other invitations were by railway men and by the National Confederation of Chambers of Commerce and the American Chamber of Commerce. The present plans for the convention call for 400 officials of railways to spend six days in Mexico City.

Street Car Line Would Quit

Robert C. Coffy, vice president and general manager of the Fort Smith Light & Traction Co., Fort Smith, Ark., has asked the city commission for permission to abandon the company's railway system in Fort Smith and Van Buren on the ground that money is being lost in its operation, and that the company is unable to meet the expenses of paving between its tracks in the $275,000 street improvement program planned by the city.

B & M Earnings Increase

The Boston and Maine Railroad earned a net income of $275,929 in January which compares with $144,780 in January last year. This improved showing was made notwithstanding a decline of $312,190 in operating revenues. As a consequence, the ratio of operating expense to operating revenue was reduced to 77.24, the best operating result since 1916. Passenger revenue declined $239,284, attributable in part to the open winter conditions, and freight revenues were off $112,229 by

comparison with January a year ago, represented almost entirely by reduced shipments of bituminous and anthracite coal.

C & O Revenues Show Decline

The gross revenues, net railway operating income and net income of the Chesapeake & Ohio including the Sewell Valley, and Greenbrier & Eastern, with operating ratio, are shown in the statement of operations for January, 1928. Gross revenues for the month were $9,921,300, a decrease of $1,054,644 under January, 1927; operating expenses were $7,197,248, a decrease of $417,003 compared with January last year; net railway operating income was $2,222,628, a decrease of $516,883 under January last year. The net income after all charges for January 1928 was $1,572,616, a decrease of $493,048 under January, 1927. The operating ratio was 72.5 per cent compared with 69.4 per cent for January last year, an increase of 3.1 per cent.

Bus Traffic Gains in Los Angeles

Bus lines of the Los Angeles Street Ry. Co. carried 14,400,456 passengers in 1927 against 10,652,828 in 1926. Passenger traffic over the street railway showed a slight decrease with a total of 332,351,789 in 1927, against 333,999,608 in 1926. The increased popularity of the bus as means of transportation is shown in the sizeable gain over the same period last year which more than supports the slight loss in street car travel.

A comparison of street-car traffic for January of this year with the same month, last year shows a decrease of 427,294. Further indication of the street car and bus's popularity is the report on the heaviest traffic month of the year. In March, 1927, 30,702,872 passengers were carried over the facilities of the Los Angeles Ry. Co. against 30,690,927 carried during the same month the previous year.

Officials are optimistic for 1928 and are confident the traffic over their lines will show a substantial increase over last year.

Nickel Plate Speeds Its Service

Passenger service improvement, including overnight trains operating reciprocally between Cleveland and Chicago, Cleveland and St. Louis and Cleveland and New York, was announced by President W. L. Ross of the Nickel Plate Road, effective Sunday, February 19. This means a substantial saving in time for Nickel Plate passenger operation, with assurance of a full business day available at destinations, or, a day and a large part of an evening, in the case of the service between Chicago and Cleveland. The new trains, which will operate daily and Sunday, will include latest type standard sleeping cars, coaches and diners.

Left to Right, Lewis Gawtry, Chairman of the Committee of Award, American Museum of Safety, Presenting Three Medals and A Certificate to J. P. Barnes, President of the Louisville Railway Co.; C. W. Kellogg, Vice President, El Paso Electric Co.; Raymond Hunt, Vice President of the Tidewater Power Co., Wilmington, N. C., and William H. Boyce, Manager, Pittsburgh Railway Co. Three Anthony N. Brady Memorial Medals and A Certificate of Honorable Mention Were Awarded by the Museum for Accident Prevention and Health Promotion Among Electric Railway Organizations in 1926. International Newsreel.

Bus Companies Merge in Georgia

Merger of ten important bus lines that are said to operate 95 per cent of the motor bus service of southern Georgia and northern Florida into the Georgia-Florida Motor Lines, Inc., a Georgia corporation capitalized at $1,000,000 is announced by officials of the new firm.

Companies affected by the merger are the Georgia-Florida Coach Lines, Inc., the Tifton Bus Lines company, Hand and Estes, Denson and Frazier State line, Georgia Coach Lines, Inc., Southern Bus line, Georgia-Florida Motor Lines, Inc., and the Pierce lines. Also associated with these major firms are the T. M. T. lines, the Ader Bus line and the Montford Motor line.

These lines operate buses covering more than 7,000 miles daily, supplying service from Atlanta to Macon, Valdosta, Jacksonville, Gainsville, Fla., and Tallahassee, Fla., and touching almost every important town of south Georgia, including Columbus, Albany, Waycross, Thomasville, Americus and Tifton.

Rock Island Prepares for Heavy Traffic

Preparations are now under way by the management of the Rock Island Lines for the expected heavy movement of traffic during 1928, by practically rebuilding over 500 miles of track, using 110-pound rails on the main lines, supported by rock ballast of the highest type. This is one of the largest programs of this kind ever undertaken by the Rock Island, involving an expenditure of nearly $6,000,000 for rail, ballast and road widening.

Until quite recently, rails weighing 90 pounds to the yard were considered heavy enough to support the traffic, but with the steady growth of the Middle West in the last few years, in agricultural and merchandise products, and oil traffic, it has been found necessary to increase the weight of the steel rails to 110 pounds, which now becomes standard on the main lines.

Some idea of the great amount of rock ballast in this new program of the Rock Island, is gained in the fact that the ballast to be used is equivalent to 15,000 carloads, or approximately 600,000

cubic yards. If this ballast were collected into one pile, it woulud be equivalent to a 12-story office building, covering an entire city block and rising to a height of 180 feet. The ballast program alone represents an outlay of over one million dollars.

Westinghouse Catalog Ready

Publication of the catalog of electrical supplies of the Westinghouse Electric and Mfg. Co. for 1928-1930 is announced. This catalog presents the electrical and mechanical features and application information for all supply apparatus and appliances manufactured by the Westinghouse Company, and in addition describes and illustrates a representative list of large motor and generating apparatus. All equipment obtainable through district offices or agent-jobbers is thoroughly described and illustrated. New equipment and modifications of former designs described in the new catalog are numerous and cover a wide variety of applications, such as instruments and relays, switchgear, traction, marine, aviation, farm lighting, motor apparatus, and prime mover apparatus.

Daily Car Movement Speedier

Despite a decrease in the volume compared with 1926, the railroads continued in 1927 to move the freight traffic offered them with the same promptness and dispatch that characterized the preceding year when the amount handled was the greatest on record. The daily average movement of freight cars in 1927, according to reports just filed for the year by the carriers with the bureau of railway economics was 30.4 miles a day. This was the same as for 1926 but was an increase of 1.9 miles above the daily average for 1925 and 3.6 miles above the average for 1924. The highest daily average for any one month on record was established by the railroads in October, 1927, when an average of 34.7 miles was attained. This exceeded by four-tenths of one mile the best previous average, which was in October, 1926.

This faster movement of freight in the past two years is due not only to the more prompt handling of both loaded and empty cars by the railroads but also to the more prompt loading and unloading of freight cars by shippers which in turn has enabled the carriers to obtain greater service out of their freight car equipment.

In computing the average movement per day, account is taken of all freight cars in service, including cars in transit, cars in process of being loaded and unloaded, cars undergoing or awaiting repairs and also cars on side tracks for which no load is immediately available.

The average load per freight car in 1927, including less than carload lot freight as well as carload freight, was 27.2 tons. This was a decrease of two-tenths of one ton under the average for 1926 but an increase of two-tenths of a ton above the average for both 1925 and 1924.

Plenty of Cars Available

Class I railroads had 369,421 surplus freight cars in good repair and immediately available for service Feb. 15, the car service division of the American Railway Association reports. This was a decrease of 48 cars compared with February 8, at which time there were 369,469 cars. Surplus coal cars on February 15 totaled 160,913, an increase of 3,036 cars within approximately a week while surplus box cars totaled 158,611, a decrease of 2,394 for the same period. Reports also showed 23,636 surplus stock cars, an increase of 451 above the number reported on February 8 while surplus refrigerator cars totaled 13,631, a decrease of 712 for the same period.

Ton Miles Show Decrease

The volume of freight traffic handled by the Class I railroads in 1927 amounted to 474,682,943,000 net ton miles, the bureau of railway economics announces. This was a decrease of 14,018,882,000 net ton miles or 2.9 per cent below the volume of freight traffic in 1926 but an increase of 18,595,711,000 net ton miles or 4.1 per cent above 1925. In the eastern district, there was a decrease of 4.8 per cent in the amount of freight traffic handled in 1927 compared with 1926 while the southern district showed a decrease of 4.4 per cent. The western district, however, reported an increase of one-half of one per cent. In December, freight traffic handled by the Class I railroads amounted to 34,579,981,000 net ton miles, a decrease of 5,535,929,000 net ton miles or 13.8 per cent below the same month in 1926. In the eastern district, the volume of freight handled by the railroads showed a decrease of 20.4 per cent while the southern district reported a decrease of 14.3 per cent. The western district reported a decrease of 3.2 per cent.

Coast Advisory Board to Meet

The next quarterly meeting of the Pacific Coast Transportation Advisory Board will be held in the Florentine Room, Clift Hotel, San Francisco, Friday, March 16. Charles E. Virden, general chairman of the board, says more than 500 shippers and railroad executives of New Mexico, Arizona, Nevada and California will be present to clear up any transportation problem that may have arisen during the past quarter year and to estimate the car service requirements for the next 90 days.

P. & G. E. To Be Sold

Reports continue in western financial circles that an American or British syndicate will take Pacific & Great Eastern Railway off British Columbia's hands for $17,000,000. Negotiations looking toward Canadian National Railways taking over the property and operating it as part of the system are under way.

The Pacific & Great Eastern reaches Vancouver 300 miles northeast to Prince George, where the National line to Prince Rupert has a division point. The British Columbian government guaranteed the bonds and spent $35,000,000 20 years ago on the line, which never paid operating expenses, though it passes through rich timber and mining area.

Frisco and Southern Pacific to Extend

Indications point to a race between the St. Louis & San Francisco and the Southern Pacific into northwest Texas where great agricultural development is in progress. The 'Frisco was negotiating with the Gulf & West Texas Railroad for purchase of its franchise with the plan of constructing a railroad between San Antonio and San Angelo, 234 miles, with a further extension from San Angelo to some point in the South Plains as its ultimate objective, when the Southern Pacific proposed extending the Austin-Llano branch of its Houston & Texas Central subsidiary from Llano northwest to Lubbock via San Angelo. The length of this extension would be approximately 400 miles. It is understood that engineers will soon be placed in the field by the Southern Pacific.

Condition of Locomotives

Locomotives in need of repair on Class I railroads February 15 totaled 9,349 or 15.5 per cent of the number on line, according to reports filed by the carriers with the car service division of the American Railway Association. This was an increase of 616 locomotives compared with the number in need of such repairs February 1, when there were 8,733 or 14.5 per cent.

Locomotives in need of classified repairs February 15 totaled 5,040 or 8.4 per cent, an increase of 279 compared with February 1, while 4,309 or 7.1 per cent were in need of running repairs, an increase of 337 compared with the number in need of such repairs February 1. Class I railroads on February 15 had 7,064 serviceable locomotives in storage compared with 7,307 on February 1.

I. C. C. Complains Against the K. C. S.

The Interstate Commerce Commission has filed complaint against the Kansas City Southern Railway under the Clayton Act, charging it violated that act in acquiring stock of the Missouri-Kansas-Texas Railroad and St. Louis Southwestern Railway.

The effect of the acquisition of the stock of these lines, the commission said, and use of it either by voting or granting of proxies, or otherwise, may be substantially to lessen competition between the three lines or to restrain commerce in certain sections and communities.

The commission announced that a hearing would be held at Washington April 2 on the complaint at which time the Kansas City Southern shall have the right to appear and show cause why an order should not be entered by the commission requiring the Kansas City Southern to divest itself of all interest, direct or indirect in capital stock of the Katy and Cotton Belt, now unlawfully held.

World's Largest Plane Flies in England

The Lee Smith Beardmore Company's Inflexible the world's largest all-metal monoplane, with a dead weight of fifteen tons, and a bold experiment in giant aircraft, made a successful trial flight at the Royal Air Force airdrome at Martlesham Heath, England, March sixth.

Although it is stated the plane is capable of carrying 20 persons, only the pilot, Squadron Leader J. Noakes and one mechanic made the flight in the presence of England's greatest aviation technicians.

Both airmen wore parachutes. The great wing span of 150 feet prevented a direct entry into any airforce hangar, necessitating skillful maneuvering. The landing wheels alone stand 7 feet 6 inches and even the tailfin rudder rises practically unsupported more than twice the height of a man above the fuselage which, with the tail wheel on the ground, is itself six feet above the earth. The stout rectangular fuselage in the cabin section is 12 feet deep, but the most vivid impression observers obtained of its immense size was to see a man walking along the wing casually as the passengers were passing along the ship's gangway. The Inflexible went aloft without mishap in less than a quarter of a mile. Rushing down the runway the Inflexible lifted easily, soon rose to 2000 feet and returned, alighting, and pulled up dead within 300 yards. Aviation experts say there is no land plane in the world today with a larger wing span or one of equal weight which ever carried its weight successfully.

Fruit and Vegetable Shipments

Nearly a million cars of fruits and vegetables move every year over the railways of the United States. This is brought out in a bulletin issued by the bureau of railway economics. The bulletin is a study of the rail movement of the principal fresh fruits and vegetables in the United States during 1924, 1925 and 1926. It deals with 33 items or commodities, 16 of which are fruits and 17 are vegetables.

The shipments of fruits and vegetables combined for the United States as a whole amounted to 943,932 carloads in 1924, 949,421 carloads in 1925, and 1,010,724 carloads in 1926, or an average of 968,025 cars yearly during the three years. The states leading in shipments of fruits in order named are, California averaging 180,741 cars a year; Florida, 54,284 cars; Washington, 40,574 cars; New York, 35,633 cars; Georgia, 32,517 cars, and Virginia, 14,580 cars. Approximately three-fourths of the total shipments of fresh fruits for the United States originated in these six states. California also leads in shipments of vegetables. The shipments from that state amounted to 52,963 cars yearly, followed by New York with 47,223 cars; Maine, 39,805 cars; Virginia, 33,094 cars; Minnesota, 29,838 cars; Florida, 29,153 cars; Texas, 24,513 cars; Colorado, 24,003 cars; Wisconsin, 22,584 cars; Michigan, 22,194 cars, and Idaho and New Jersey with 17,135 and 15,906 cars, respectively. These twelve states in the aggregate originated nearly three-fourths of the total shipments of fresh vegetables.

Railroads Pay Government Loans

Treasury reports show that the railroads of the United States which borrowed money from the government at the end of federal operation have reduced their indebtedness from an original $600,000 000 to $78,800,000.

By June 30, the treasury expects the indebtedness to be reduced to $50,000,000, which will virtually shut off one source of income that in recent years has swelled treasury receipts.

Since last June, the railroads have paid $155,919,000, the latest payment being $45,000,000 from the Chicago, Milwaukee, St. Paul & Pacific and $7,000,000 from the New York, New Haven & Hartford. Only three other debts of consequence remain unpaid, $19,386,000 of the Boston & Maine, $8,073,000 of the Chesapeake & Ohio and the account of the Seaboard Airline due in installments ending in 1935. The debts of the remaining 35 lines are small in comparison with the original loans.

HUTCHINSON TRAIN INDICATORS

NEW MODEL SHOWING MAKE UP OF TRAINS

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Can. Nat'l.
Mich. Cent.
Cent. of N. J.
Long Island
K. C. Southern
C. R. I. & P.
Santa Fe
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Freight Cars in Good Order

Freight cars in need of repair on February 15 totaled 136,346 or six per cent of the number on line, according to reports filed by the carriers with the car service division of the American Railway Association. This was an increase of 231 cars above the number reported February 1, when there were 136,115 or six per cent. Freight cars in need of heavy repairs February 15 totaled 96,338 or 4.3 per cent, a decrease of 356 compared with February 1, while freight cars in need of light repairs totaled 40,008 or 1.7 per cent, an increase of 587 compared with February 1.

A Little More Mileage Was Built in 1927

About 780 miles of main line railroad was built in the United States in 1927. With the exception of 1926, last year witnessed the largest amount of new road construction since 1917. In addition to the mileage laid, 446 miles of additional running tracks were constructed, as compared with 473 miles in 1926. In 1927, there were 282 miles of road abandoned, against 457 miles in 1926, and 606 in 1925. At the end of 1927 approximately 900 miles of road were under construction, the larger part of which will probably be completed during the first half of 1928. Abandoned mileage amounted to 282 miles in 1927 against 457 miles in 1926 and 606 miles in 1925.

Revenue Loading Going Down

Loading of revenue freight for the week ended February 18 totaled 887,891 cars, according to reports filed by the car service division of the American Railway Association. This was a decrease of 18,118 cars below the preceding week with decreases being reported in the total loading of all commodities. The total for the week of February 18 also was a decrease of 66,903 cars below the same week in 1927 and a decrease of 44,390 cars compared with the corresponding week two years ago.

Miscellaneous freight loading for the week totaled 321,980 cars, a decrease of 5,013 cars below the same week last year and 9,500 cars below the same week in 1926. Coal loading totaled 157,036 cars, a decrease of 56,459 cars below the same week in 1927 and 12,877 cars below the same period two years ago. Grain and grain products loading totaled 41,188 cars, a decrease of 1,033 cars below the same week last year and 1,740 cars below the same period in 1926. In the western districts alone, grain and grain products loaded totaled 28,636 cars, an increase of 1,348 cars above the same week in 1927. Live stock loading amounted to 31,644 cars, an increase of 4,137 cars above the same week last year and 4,590 cars above the same week in 1926. In the western districts alone, live stock loading totaled 24, 686 cars, an increase of 3,958 compared with the same week in 1927. Loading of merchandise and less than carload lot freight totaled 248,974 cars, a decrease of 3,885 cars below the same week in 1927 and 6,848 cars below the same week two years ago.

All districts except the northwestern reported decreases in the total of all commodities with the same week last year, while all except the northwestern and central western reported decreases compared with two years ago.

Fuel Consumption Makes Low Record

Class I railroads attained the greatest efficiency in 1927 in the use of fuel by road locomotives on record, according to complete reports for the year just filed by the railroads. An average of 131 pounds of fuel was required in 1927 to haul 1,000 tons of freight and equipment, including locomotive and tender, for one mile. This was the lowest average ever attained by the railroads since the compilation of these reports began in 1918, being a decrease of six pounds under the best previous record established in 1926. For every pound of coal or its equivalent used, the railroads in 1927 hauled 7.6 tons of freight and equipment one mile. This means that for every 2.1 ounces of coal, the railroads in view of the striking increase in efficiency, hauled an average of one ton of freight and equipment one mile. Class I railroads in 1927 utilized for road locomotive fuel, 95,459,840 tons of coal and 2,042,137,055 gallons of fuel oil. In each instance, a decrease was shown under 1926 due wholly to the reduction in traffic handled.

The Busy Western Pacific

The Western Pacific Railroad has filed with the Interstate Commerce Commission in Washington application for permission to purchase the Petaluma & Santa Rosa Railway. Some weeks ago the Southern Pacific and the Santa Fe, acting jointly, filed with the commission application for permit to purchase this line. The Petaluma & Santa Rosa operates a line between those two cities, the other principal city on the line being Sebastopol. The line has 48 miles of trackage, 38 being main line, and the company also operates two steamboats from Petaluma to San Francisco.

Fewer Accidents in 1927

Reports for the first ten months in 1927, just filed by the railroads of this country with the Interstate Commerce Commission show a reduction under the corresponding period in 1926 not only in the number of accidents at highway grade crossings but also in the number of casualties resulting therefrom.

In the first ten months in 1927, 4,373 accidents at highway grade crossings were reported, a decrease of 242 compared with the corresponding period in 1926. Persons killed in such accidents for the ten months period in 1927 totaled 1,900 or 86 below the same period the year before. Reports also showed 5,179 persons injured, or a reduction of 289 compared with 1926.

In an effort to impress upon the public the necessity for greater care being exercised in passing over highway grade crossings, the railroads have been and are conducting a widespread campaign in the hope of bringing about a reduction in the number of such accidents as well as a reduction in the number of casualties.

Railway Construction

Tracks and Yards

ALABAMA.—See item under Building and Structures, Mobile.

ARKANSAS.—It is said the Missouri Pacific will spend $1,100,000 this spring in raising about 13 miles of line between Little Rock and Texarkana above flood level. The track will be raised an average of 5 ft. and will require more than 565,000 cu. yds. of ballast. About 3100 feet of bridges also will be raised.

CALIFORNIA.—The Sacramento Northern has been authorized by the I. C. C. to construct about 13 miles of line in Yolo and Solano counties, from a connection at Lisben with the San Francisco-Sacramento, in a southerly direction to a point near the southern line of Reclamation District No. 999. Estimated cost $738,709. Permission has been granted the Sacramento Northern to operate over the San Francisco-Sacramento lines between West Sacramento and Lisbon, about 8 miles.

—See Buildings & Structures, Fresno.

CANADA.—It is reported the Canadian

The Silk Express

THOUSANDS of tons of raw silk from the Orient pour into our western seaports en route to New York, the great raw silk market of America. When a ship arrives in port, the precious cargo is speedily transferred to special steel cars. It is not unusual for a ten-car train to be loaded with 2500 bales in less than three hours.

These trains are given right-of-way over all others, for the speed at which they travel is the best safeguard against theft and deterioration. The average running time from Seattle to Hoboken is eighty-five hours. Not even a passenger can cover the distance more quickly.

This is but one example of modern railroading. It is this intelligent cooperation with American industry on the part of the railroads that has been in great measure responsible for today's prosperity.

For 15 years the Oxweld Railroad Service Company has been contributing its share to the development of efficient railroad operation. It is supplying up-to-the-minute oxwelding service to a majority of the important railroads in the country.

Oxweld Railroad Service

A Great Chicago Terminal

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Unit of Union Carbide and Carbon Corporation

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Pacific will construct new lines in Manitoba, Saskatchewan, Alberta and British Columbia in 1928. Coaling stations are to be constructed at Elkhorn, Man.; Hardisty, Alta., and other points along the line. Combined freight and passenger stations will be constructed at a dozen or more places. Grade revision will be undertaken on the main line between Brandon, Man. and Sidney.

—The Alberta government has requested permission to construct an extension to the Edmonton-Dunvegan & British Columbia Ry., from Wembley and Spirit River into British Columbia.

COLORADO.—The Denver & Rio Grande Western is receiving bids for a tunnel in Glenwood Canyon, and for enlargement of tunnels between Pueblo and Alamosa.

ILLINOIS.—The Erie has completed its new automobile and team track yard along Canal street in Chicago between 23rd and 29th streets. The yard is in three units with a total capacity of 456 cars.

INDIANA.—Examiners for the I. C. C. have recommended denial of the application of the Algers, Winslow & Western for authority to build a line from Littles to Algers, about 15 miles.

MICHIGAN.—The I. C. C. has made public a proposed report by its examiners recommending authority be given the Detroit, Grand Haven & Milwaukee, the Pontiac, Oxford & Northern, and the Michigan Air Line, subsidiaries of the Grand Trunk Western to construct a belt line of 6.63 miles around a part of Pontiac. It also recommended the Pere Marquette be denied authority to construct a belt line around Pontiac and an extension from Wixom to Pontiac.

MISSOURI.—The Manufacturers Railway Co. has applied to the I. C. C. for authority to construct approximately 4½ miles of line in St. Louis to connect with the new St. Louis municipal bridge across the Mississippi River.

—The Missouri Pacific will construct 16.6 miles of double track on the St. Louis-Kansas City line between Allenton and Labaddie to cost about $4,885,000. The contract has been let to J. A. Kreis & Sons, Knoxville, Tenn.

NEW MEXICO.—See item under Oklahoma, Tracks and Yards.

OHIO.—The Pittsburgh, Lisbon & Western has applied to the I. C. C. for authority to construct a branch line from Mill Rock to Youngstown, 27 miles, and one from Negley to Smith's Ferry, Pa., 13 miles.

—The Montour Railroad has asked permission to acquire control of the Lisbon line through purchase of its outstanding stock.

OKLAHOMA.—The Beaver, Meade & Englewood Co. has applied to the I. C. C. for authorization to construct an extension from Hooker, Okla., to Des Moines, N. M. The cost of the first section, from Hooker to the New Mexico state line is estimated at $20,240 a mile.

OREGON.—The Linn County Logging & Lumber Co. has applied to the I. C. C. for permission to construct 68 miles of line from a point on the Oregon Electric line between Albany and Conser to Cascadia.

TEXAS.—The St. Louis, Brownville & Mexico has applied to the I. C. C. for authority to construct 34 miles of new line in Brazoria, Matagorda and Galveston counties.

—It is reported the St. Louis Southwestern will spend $2,900,000 in 1928 to reconstruct 162 miles of its lines, including a revision of grades and the alignment of the line between Mt. Pleasant and Tyler, and between Sulphur Springs and Dallas.

The Cane Belt has applied to the I. C. C. for authority to construct a 35 mile extension from its line in Wharton county to the Gulf, Colorado & Santa Fe line near Thompsons, to be leased to the G. C. & S. F., it is said.

VIRGINIA.—The Prince George & Chesterfield Co., now being organized, has applied to the I. C. C. for permission to build a 14-mile line between Chester and Hopewell, it is reported. This line probably will be operated by the Seaboard Air Line.

WYOMING.—Work has begun on the Union Pacific branch line from Egbert north to Creighton, 53 miles. The contract was let to the Utah Construction Co., Ogden, for the grading and placing of culverts. The total cost of the extension is estimated at about $2,500,000.

Buildings and Structures

ALABAMA.—Mobile. The Tennessee & Northern has announced plans for a yard having a capacity of nearly 600 cars, a freight station and a locomotive terminal at a total cost of about $40,000.

CALIFORNIA.—Fresno. The Southern Pacific, it is reported, has prepared plans for a classification yard, the first unit of which will be built in 1928 to consist of 23 miles of track, a 36,000-gal. capacity oil pump, a 150-ton capacity scale, two 65,000-gal. steel water tanks, a store building and telegraph and yard offices. The ultimate cost of the yard is estimated at $2,000,000.

CANADA.—Brandon. The Canadian Pacific is planning a new power house.

—Nelson. The Canadian Pacific is planning the rebuilding of the enginehouse. Also see Canada, Tracks & Yards.

GEORGIA.—Howells. The Seaboard Air Line will construct an office building costing about $15,000. The contract has been let to the C. V. York Co., Raleigh, N. C.

ILLINOIS.—Chicago. The C. B. & Q. has ordered a 50-ton automatic, shallow pit, locomotive coaling plant with a coaling plant with a single track cinder handling plant from the Roberts & Schaefer Co.

INDIANA.—Frankfort. The New York, Chicago & St. Louis has awarded a contract for two electric cinder handling plants to the Roberts & Schaefer Co., Chicago.

MASSACHUSETTS.—Pittsfield. The General Electric Co. is planning a plant here to be 280 ft. by 40 ft. and 2 stories high.

MICHIGAN.—Rogers City. The Roberts & Schaefer Co., Chicago, has received a contract for a 150-ton steel, automatic electric, simplex coaling plant for the Michigan Limestone & Chemical Co.

MISSISSIPPI.—Vicksburg. The Vicksburg Bridge & Terminal Co., has let contracts for a combined railway and highway bridge across the Mississippi River to be used by the Yazoo & Mississippi Valley. The cost will be about $3,000,000. Contract for the substructure for the river span has been let to the United Engineers & Constructors, Inc., Philadelphia; for construction of the sub-structure for the west approach trestle to the Virginia Bridge & Iron Co., Roanoke, Va.; for grading of the embankment in the west approach to J. A. Kries & Son, Knoxville, Tenn., and the superstructure of the river spans and the east end of the bridge trestle and the superstructure of the west approach trestle to the American Bridge Co.

OREGON.—Eugene. The Southern Pacific, Pacific lines, has let a contract to H. E. Wilder, Eugene, for a steel machine shop with corrugated metal siding to cost, with facilities, $242,000.

PENNSYLVANIA.—Lancaster. The Pennsylvania has let a contract to D. S. Warfel of Lancaster for the rearrangement of cattle pens and tracks at an estimated cost of $40,000.

PENNSYLVANIA.—Philadelphia. A contract for concrete foundations for the cold storage warehouse at the Pennsylvania Produce Terminal has been let to Sinclair & Grigg of Philadelphia by the Pennsylvania, it is said. The cost will be about $100,000.

TEXAS.—San Angelo. It is reported the Gulf, Colorado & Santa Fe will construct a freight station and five-stall steel and concrete enginehouse. Bids will be received in about a month.

WISCONSIN.—Appleton. The Chicago & North Western is said to be planning a freight station and office building. The station is to be brick, 40 ft. by 218 ft. and two story office building at one end to be 40 ft. by 40 ft.

WISCONSIN.—Baraboo. The Chicago & North Western will construct a 55 ft. steel bridge spanning a highway. Contract for the substructure has been let to Peppard & Burrill, Minneapolis.

WISCONSIN.—Milwaukee. A contract has been let by the Milwaukee to Henry Danischefsky, Milwaukee, for a freight station at North avenue.

WISCONSIN.—Spring Green. A bridge 1,540 ft. long and supported by giant concrete piers sunk 37 ft. in the river bed is being built over the Wisconsin River by the Milwaukee. New bridges are to be built at Lone Rock and at Woodman. Supplementing the bridges new 85-lb. rails are to be laid.

Locomotive Orders

According to the A.R.A. Class I railroads installed 154 locomotives in service in January. This was an increase of nine locomotives compared with January, 1927, but a decrease of 37 under the same month in 1926. Locomotives on order on February 1 totaled 173 compared with 318 on the same date last year and 493 on the same date two years ago. The largest order placed in February was the Union Pacific with the American Locomotive Co. for 23 3-cyl. 4-12-2 engines and 15 additional 12-wheel tenders. Other orders awarded to the American Locomotive Co. are: New York Central, 10 locomotives; Tennessee Copper Co., ore switching (6); Northern Pacific, ore 2-8-8-4 articulated type; Alabama State Docks Commission, ore, switching (6). The Sinclair Refining Co. ordered one switching (6) from Baldwin. The Donner Steel Co., Buffalo, ordered one 60-ton oil electric and the American Rolling Mill Co., one 100-ton oil electric, both to be built by the Ingersoll-Rand Co., the General Electric Co. and the American Locomotive Co. The Southern Pacific is inquiring for 16 engines; the Omaha for eight switching engines, and the Akron, Canton & Youngstown for two Mikados.

Passenger Car Orders

Our records show orders placed during the past month for 103 regular passenger service cars and two gas electric cars. The following orders were placed with the Pullman Car & Mfg. Co.: Union Pacific, 15 coaches and 10 dining cars; Soo Lines, eight combination baggage and smoking cars; Burlington, six baggage cars and three passenger cars; Chicago & Alton, seven baggage and mail cars, and two postal cars; Nickel Plate, one private car; Rock Island, 10 coaches. The American Car & Mfg. Co. received orders from the Rock Island for 10 baggage cars, and six baggage and mail cars; Delaware & Hudson, three combination mail and baggage cars; Central Railway of Brazil, 12 passenger cars. The Standard Steel Car Co. received an order from the Rock Island for 10 suburban cars. The orders for the gas electric cars were placed by the Reading Co., for one double power plant combination passenger, baggage and mail car with the J. G. Brill Co., and the Manitoba Power Co., Winnipeg, for one 52-ft. single unit car with the Mack Trucks, Inc.

Inquiries have been issued for the following equipment: Canadian National, 55 passenger cars; St. Paul, 10 baggage cars; Katy, eight combination mail and baggage cars; Richmond, Fredericksburg & Potomac, one cafe car; Boston & Maine, 10 combination baggage and mail cars; Paulista Railway of Brazil, seven sleeping cars; State Railways of Uruguay, three first class passenger cars, one first class Pullman car, two first class dining cars, and two baggage cars;

JORDAN SPREADER

THE COMPOSITE SPREADER DITCHER—which can be changed in the field either for ditching or for spreading—performs all the functions of the Spreader (moving earth, spreading bulky material, plowing snow) and in addition will shape the ballast and subgrade, form new ditches and clean out old ones and trim the banks of cuts to a universal slope. An all-year Machine. In use on North America's leading railroads. Write for catalog.

O. F. JORDAN COMPANY

WALTER J. RILEY, President EAST CHICAGO, INDIANA

Chicago, Indianapolis & Louisville, one gas electric rail motor coach; Rock Island, 11 gas electric rail motor cars; Northern Pacific, four gas electric rail motor cars. It is reported the North Western Pacific will place an order shortly for 10 passenger cars.

Freight Car Orders

Freight cars placed in service in January numbered 2,899 compared with 5,484 in January, 1927, and 4,907 in January, 1926, according to reports filed with the American Railway Association. The railroads had 19,048 freight cars on order on February 1. There were 29,042 on order on February 1, 1927, and 50,636 on order on February 1, 1926. The largest order placed during the past month was that of the Pacific Fruit Express for 2000 refrigerator cars, divided between the Pullman Car & Mfg. Co., and the Pacific Car & Foundry Co. The Anglo-Chile Nitrate Co. ordered 50 flat cars from the American Car & Foundry Co.; the Union Pacific, 500 flat cars from the Bettendorf Co.; Amtorg Trading Corpn., 200 dump cars from the American Car & Foundry Co.; the Soo Line, 200 box cars from Pullman and 200 box cars from the Siems Stembel Co.; the Burlington, 150 ballast cars from the Rodger Ballast Co.; the Conley Tank Car Co., 50 tank cars from the American Car; Butler Bros., Ironton, Minn., eight air dump cars from the Koppel Industrial Car & Equipment Co.; the Wheeling Steel Co., four 20 cu. yd. air dump cars and 12 30 cu. yd. air dump cars from Koppel; the Booth & Flinn Co., Pittsburgh, 32 gondola cars from the Bethlehem Steel Co., the American Smelting & Refining Co., 60 gondola cars from Koppel; the Frisco, six air dump cars from the Magor Car Corpn.; the Union Refrigerator Transit, 50 refrigerator cars from the American Car; Wilson & Co., 300 refrigerator cars from Bettendorf.

Other orders were: Swift Co., 300 steel underframes from Bettendorf; Baltimore & Ohio, 2000 car bodies from Standard; Norfolk & Western, rebuilding 1000 hopper coal cars, Ralston; Chicago Great Western, 50 stock car underframes and five caboose underframes from the Bradford Corpn.; Nashville, Chattanooga & St. Louis, 500 center construction for freight cars from the Tennessee Coal, Iron & Railroad Co.

The largest inquiry in the market is that of the St. Paul for 4,650 cars. The company is asking for prices on 1000 hoppers, 2500 box, 650 stock, 300 automobile and 200 ore cars. The Berwind-White Coal Mining Co. is inquiring for 1200 mine cars; the North Western for 1000 automobile cars; the South Manchurian Railway for 20 air dump cars; the Sinclair Refining Co. for five coke cars; the State Railways of Uruguay for 10 box, 32 stock and one auxiliary crane; the North American Car Co., for 300 live poultry cars; Fruit Growers' Express for 1200 steel underframes; the Frisco for 250 underframes; the Western Union for five steel underframes and trucks for box cars; and the Detroit & Toledo Shore Line for 192 gondolas.

Changes in Personnel

Executive and Operating

William H. Williams has been elected chairman of the board of directors of the Texas Pacific-Missouri Pacific Terminal Railroad of New Orleans; **L. Warrington Baldwin,** president; **J. L. Lancaster,** vice president; **C. W. Veitch,** vice president, assistant secretary and assistant treasurer; **L. F. Mellersten,** assistant secretary; **Carl A. deGersdorff,** general counsel, and **Thomas J. Freeman,** general solicitor.

The Soo Line has announced the following appointments: **Frederick W. Curtis,** superintendent of the Twin City Terminal division, with headquarters at Minneapolis, has been appointed assistant to the general superintendent of transportation; **Clinton B. Wilson,** trainmaster of the Gladstone division, with headquarters at Gladstone, Mich., will succeed Mr. Curtis as superintendent of the Twin City Terminal division; **Herbert D. Keene** has been appointed assistant superintendent of the Twin City Terminal division, with headquarters at Minneapolis; **Walter H. Mann,** trainmaster of the first district of the Fond du Lac division, with headquarters at Fond du Lac, has been promoted to superintendent of the Winnipeg division, with headquarters at Thief River Falls, Minn.; **George H. Nolan** has been appointed assistant superintendent of the Stevens Point division, with headquarters at Ironwood, Mich; **William D. Boyce,** trainmaster of the Stevens Point division, with headquarters at Stevens Point, Wis., has been transferred to the first district of the Fond du Lac division, replacing Mr. Mann; **Edwin D. Jones,** trainmaster of the second district of the Fond du Lac division, with headquarters at Fond du Lac, will succeed Mr. Boyce; **Edwin E. Nelbecker** will succeed Mr. Jones as trainmaster of the second district of the Fond du Lac division; **James R. Branley,** trainmaster of the Duluth-Superior division, with headquarters at Superior, has been transferred to the Gladstone division to replace M. Wilson. **Harold A. Sparks** assistant trainmaster on the Duluth-Superior division, with headquarters at Crosby, will succeed Mr. Bradley as trainmaster, and **Ralph O. Jensen** will succeed Mr. Sparks as assistant trainmaster at Crosby. **Charles M. Winter,** assistant to the general manager, with headquarters at Minneapolis, has been appointed acting superintendent of the Missouri River division replacing **George S. Baxter** who has been granted a leave of absence. Mr. Baxter was transferred February 21 from superintendent of the Minnesota division. **William H. Corbett,** superintendent of the Duluth-Superior division with headquarters at Superior, has been transferred to the Minnesota division to succeed Mr. Baxter, with headquarters at Enderlin, S. D. **Charles L. Simpson,** superintendent of the Missouri River division, has been appointed superintendent of the Duluth-Superior division, to succeed Mr. Corbett.

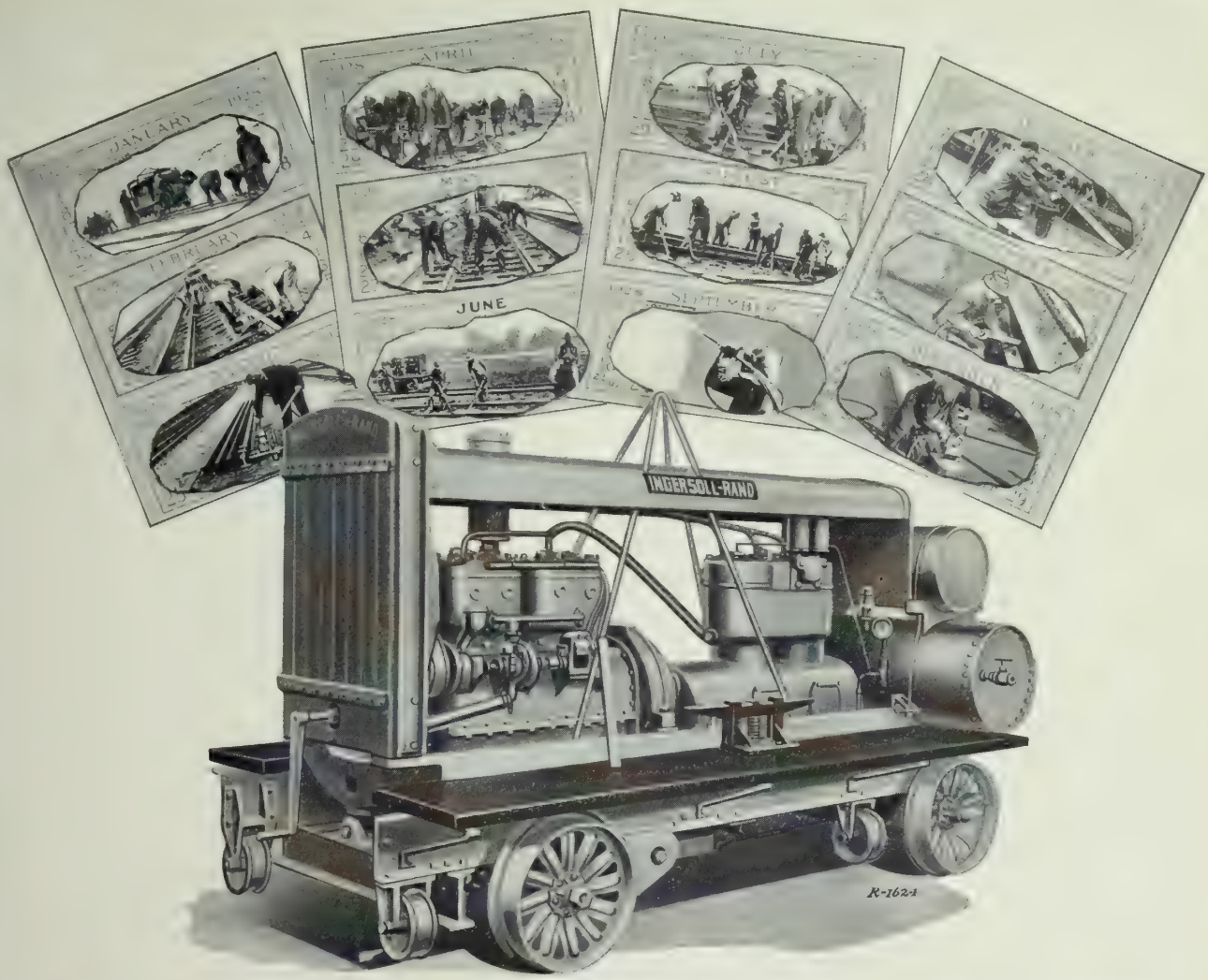
Curtis M. Yohe, son of **J. B. Yohe,** vice president of the Pittsburgh & Lake Erie has been appointed assistant to **President Crowley** of the New York Central.

The Milwaukee has announced that **C. M. Dukes,** assistant to the chief operating officer, with headquarters at Chicago, has been promoted to assistant vice president in charge of operation, with headquarters at the same point.

The Erie has announced that the jurisdiction of **W. White,** superintendent of the Mahoning division of the western district, with headquarters at Youngstown, Ohio, has been extended to include the line between Meadville, Pa., and Kent, O., which will be known as the second district of the Mahoning division.

C. K. Bartlett, trainmaster on the Quebec Central, has been appointed superintendent, with headquarters at Sherbrooke, Que. to succeed **J. T. Reid,** deceased. **W. J. Nutbrown,** chief train dispatcher will succeed Mr. Bartlett as trainmaster.

A. B. Taylor has resigned as joint



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superintendent of telegraph of the New York Central Lines, Buffalo and east, the Western Union Telegraph Co. and the Great North Western Telegraph Co. and will be succeeded by **S. L. Van Akin,** with headquarters at New York. **C. L. Steinhart** will succeed Mr. Van Akin as assistant superintendent of these companies.

The Pennsylvania announces these appointments: **W. R. Triem,** freight trainmaster on the Panhandle division, with headquarters at Pittsburg, has been made superintendent of the Buffalo division with headquarters at Buffalo; **J. H. McClintock,** trainmaster on the Columbus division at Columbus has been transferred to succeed Mr. Triem, and **F. M. Krick,** assistant trainmaster at Columbus, has been promoted to succeed Mr. McClintock.

Gordon F. Proudfoot, vice president of the Lake Erie, Franklin & Clarion, has been elected president, succeeding **General Charles Miller,** deceased.

F. I. Hardy, assistant to the president of the Boston & Maine, has resigned to become president of the Woodbury Granite Co. of Vermont, with headquarters at Burlington, Vt.

Luther Reynolds, general superintendent of the Gainesville and Northwestern with headquarters at Gainesville, Ga., has resigned and will be succeeded by **Frank P. Lockhart** auditor and traffic manager.

The Canadian National has announced that the title of **A. C. Barker,** superintendent transportation, has been changed to general superintendent transportation.

The Virginian has appointed **L. A. Markham,** former supervisor of wages, with headquarters at Norfolk, Va., to the position of assistant to the president, with the same headquarters.

Worth Rogers, telegraph and telephone engineer of the Missouri Pacific, has been promoted to superintendent of telegraph, with headquarters at St. Louis, to succeed **June C. Browne,** deceased.

W. S. Palmer, president of the Northwestern Pacific, has retired and will be succeeded by **E. H. Maggard,** president and general manager of the Petaluma and Santa Rosa.

William H. King, Jr. vice president in charge of purchases of the Seaboard Air Line, has been appointed assistant to the president, with headquarters at Norfolk, Va.

J. A. Quick, chief clerk to the superintendent of the Pacific Great Eastern, has been appointed acting superintendent, with headquarters at Vancouver, B. C. to succeed **H. M. Graham,** resigned.

R. L. Davis, trainmaster on the Kansas City, Mexico & Orient, with headquarters at San Angelo, Texas, has been appointed assistant to the president, with headquarters at Wichita. Mr. Davis is succeeded at San Angelo by **O. W. Erwin. E. K. Kieffer** has been appointed assistant superintendent, with headquarters at San Angelo.

Oswald Wilson has been appointed agricultural agent of the Northwestern Pacific.

E. C. Bagwell has been elected to the new office of operating assistant to the vice president of Seaboard Air Line. He will have his headquarters at Savannah.

John J. Clarke, superintendent of transportation of the Mexican, with headquarters at Mexico City, has retired and has been succeeded by **C. I. Luque,** assistant superintendent of transportation.

The Louisiana & Arkansas, has elected the following officers: **H. C. Couch,** president, with headquarters at Texarkana, Ark.; **W. C. Ribenack,** executive vice president with headquarters at Texarkana; **J. A. Buchanan,** vice president with headquarters at Texarkana; **C. S. McCain,** vice president with headquarters at New York, and **C. P. Couch,** vice president with headquarters at Dallas. **B. S. Atkinson,** traffic manager, with headquarters at Texarkana, has been elected vice president with the same headquarters. **C. G. Lunday,** vice president and general manager at Minden, La. has been elected vice president, with the same headquarters.

The Soo Lines announce that **Ferdinand M. Christen,** acting superintendent of dining and sleeping cars has been appointed superintendent of dining and sleeping cars, with headquarters at Minneapolis.

George Masten, superintendent of the Virginian at Princeton, W. Va., has been appointed general superintendent with headquarters at the same point.

H. F. Smith, for 30 years vice president and traffic manager of the N C & St L, has been named senior vice president, a newly created post.

The Canadian Pacific announces the following promotions: **A. Sturrock,** assistant superintendent of motive power, western lines, with headquarters at Winnipeg, has been given an indefinite leave of absence and has been succeeded by **T. Hambley,** master mechanic of the Algoma district, with headquarters at North Bay, Ont.; Mr. Hambley has been succeeded by **Edward G. Bowie,** division master mechanic of the London division, with headquarters at London, Ont., and **H. Smith,** locomotive foreman on the Ontario district at Toronto, Ont., has been promoted to division master mechanic of the London division to replace Mr. Bowie.

Frank S. Mitten, trainmaster of the Buffalo division, of the Lehigh Valley, with headquarters at Buffalo, has been appointed superintendent of the Mahoney & Hazleton division of the Lehigh Valley, with headquarters at Hazleton, Pa.

Gifford D. Wadsworth, general freight and passenger agent of the Quebec Central, has been appointed assistant general manager, with headquarters at Sherbrooke, Que.

The Pennsylvania has announced the following changes: **J. G. Elliott,** assistant trainmaster on the Cleveland and Pittsburgh division, with headquarters at Wellsville, Ohio, has been transferred to Cambridge, Ohio; **T. L. Grady,** assistant trainmaster on the Allegheny division, with headquarters at Oil City, Pa., has been transferred to Wellsville, succeeding Mr. Elliott, and **M. F. Lewis** has been appointed assistant trainmaster at Oil City, replacing Mr. Grady.

J. W. Morse, assistant road foreman of engines on the Monongahela division, with headquarters at Uniontown, Pa., has been appointed assistant trainmaster at that point in addition to his other duties. **J. L. Pringle,** trainmaster on the Monongahela division, with headquarters at Uniontown, has been transferred to the Conemaugh division, with headquarters at Pittsburgh. **J. G. Kulp,** assistant trainmaster on the Allegheny division, has been promoted to trainmaster on the Monongahela division to succeed Mr. Pringle, and the position formerly held by Mr. Kulp has been abolished.

Financial and Legal

The Rock Island announces that **R. H. Carleton** has been appointed assistant general auditor to succeed **Alfred Hermany,** retired. **A. C. Middleton** succeeds Mr. Carleton as auditor of disbursements, and **J. M. Gallagher** succeeds Mr. Middleton as assistant auditor of disbursements.

John Leslie, vice president and controller of the Canadian Pacific, has been appointed vice president in charge of finance to succeed **I. G. Ogden,** deceased. He also was appointed treasurer. **Ernest Edward Lloyd,** assistant controller, will succeed Mr. Leslie as controller.

W. R. Evans has been appointed land and tax commissioner of the St. Louis, San Francisco & Texas and the Ft. Worth & Rio Grande, with headquarters at Ft. Worth.

The Louisville, Henderson & St. Louis has announced that **F. D. Ferry,** purchasing agent, with headquarters at Louisville has been elected secretary and treasurer, with headquarters at the

Santa Fe Improvement Program *for* 1928

Railways serving a growing country are never finished. They must add yearly to the number of cars and locomotives in order to care for increasing traffic. They must build extensions and provide second and third tracks. They must provide larger terminal yards and longer and more sidings. They must provide heavier bridges and larger and more commodious stations, roundhouses and shops.

This expansion in facilities requires additional cash investment in the railroads of this country, amounting to over half a billion dollars annually.

The Santa Fe proposes to spend 45 million dollars on its program for enlargement of such facilities during 1928.

Orders have already been placed for 3,850 new freight cars, 75 all-steel passenger train cars, and 771 miles of new steel rail, of which 490 miles will be 110 lbs. to the yard and the balance 90 lbs. When this steel is laid the Santa Fe will have 2,182 miles of 110 lb. rail all laid since January 1, 1925. Orders have been placed for steel for bridges, ties have been purchased, and work on more second track and other improvements is in progress.

The Santa Fe puts this large additional investment of new money into its property to increase its capacity, to render service, to promote safety, and to take care of the growing needs of the country it serves.

W. B. STOREY, *President*
The Atchison, Topeka and Santa Fe
Railway System.

same point. Mr. Ferry succeeds **Ridgely Cayce**, deceased.

W. F. Gorman has resigned as right of way and tax agent of the Chicago, Rock Island & Gulf and will be succeeded by **G. T. Deibert**, with headquarters at Ft. Worth.

C. S. Pope, auditor of miscellaneous companies of the Soo Lines with headquarters at Minneapolis, has been appointed assistant to the controller, with headquarters at the same point. His former position has been abolished.

The Louisiana & Arkansas announces that **L. Garrett** has been elected secretary, with headquarters at Texarkana and **Randolph G. Pack** has been elected assistant secretary, with headquarters at New York.

F. H. Ratcliffe has resigned as treasurer of the Boston & Albany and has been succeeded by **C. B. Foster.**

L. B. Unwin, assistant auditor of miscellaneous accounts of the Canadian Pacific and **E. A. Leslie**, chief accountant in the joint facility bureau, have been appointed assistant controllers, with headquarters at Montreal.

Purchases and Stores

The Atlantic Coast Line has appointed **N. V. Oldenbuttel** assistant general storekeeper with headquarters at Waycross, Ga. with jurisdiction over the second and third divisions. Mr. Oldenbuttle was storekeeper at Waycross, and will be succeeded by **J. C. McLendon** who has been transferred from Southover, Ga. **J. J. Goins**, assistant storekeeper at Montgomery, Ala. has been appointed storekeeper at Southover to succeed Mr. McLendon.

Ernest S. Newton, storekeeper of the Gulf, Colorado & Santa Fe, with headquarters at Clebourne, Tex., has been promoted to purchasing agent and storekeeper, with headquarters at the same point.

The Kansas City Southern announces that **P. N. Wickham** and **Henry A. Gibson** have been appointed traveling freight agents with headquarters at Minneapolis and Tulsa, respectively.

C. A. Marshall, stores inspector of the Wabash, with headquarters at St. Louis, has been appointed division storekeeper of the Central of New Jersey, with headquarters at Elizabethport.

Traffic

The St. Louis-San Francisco has announced the following promotions: **S. S. Butler**, freight traffic manager, has been promoted to general freight traffic manager; **J. N. Cornatzar**, passenger traffic manager, has been given the additional title of director of development; **B. H. Stanage**, assistant freight traffic manager has been promoted to traffic manager and will have charge of all I. C. C. work; **Robert N. Nash**, assistant freight traffic manager has been appointed freight traffic manager vice Mr. Butler, and **J. M. Strupper**, assistant general freight agent has been appointed assistant freight traffic manager.

F. C. Campbell, general agent of the Wheeling & Lake Erie and the Lorain & West Virginia, with headquarters at New York has been named assistant general freight agent, with headquarters at Cleveland, and will be succeeded in New York by **T. A. Weybrecht.**

The Missouri Pacific has announced that **O. C. Olsen**, foreign freight agent, with headquarters at St. Louis, has been appointed general foreign freight agent, with headquarters at the same point. **W. F. Severns**, chief clerk to the general freight traffic manager at St. Louis, has been appointed assistant general freight agent.

The Chicago & North Western has promoted **M. B. Hutchins**, traveling freight agent at St. Louis, to general agent, with headquarters at Cincinnati.

The Erie announces the following appointments: **Clarence M. Knowles** to be appointed general agent in the passenger department, with headquarters at

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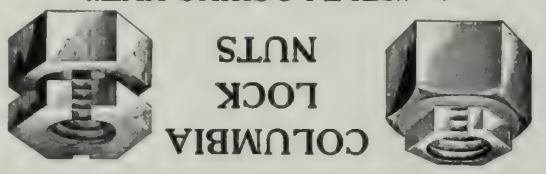
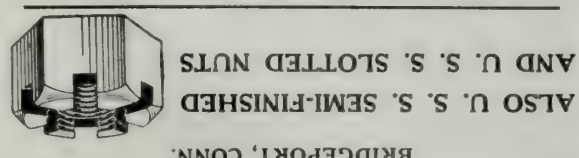


COLUMBIA LOCK NUTS

A "SELF-LOCKING-NUT"

Standard sizes and dimensions. Easily applied without waste of time or injury to threads. CANNOT shake loose. FREIGHT CARS all over the country have them on. They have stood the test of years.



COLUMBIA "GIB" NUTLOCKS

Square Hexagon

A "SAFETY" NUT LOCK

Apply with fingers till holding nut is met—then wrench. Note time saved—material saved—money saved—PIECE WORKERS like them.

ALSO U. S. S. SEMI-FINISHED AND U. S. S. SLOTTED NUTS

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'RALSTON BUILT'

Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
COLUMBUS, OHIO

Buffalo, to succeed **J. H. Webster,** transferred; **Thomas R. Patton** has been appointed general agent in the passenger department at Cleveland, and **Harry T. Harlow,** general western passenger agent with headquarters at Chicago, has been appointed general passenger agent, with headquarters at the same point to succeed **H. C. Holabird,** retired.

The Canadian National announces the following appointments: **W. J. Moffatt,** district passenger agent with headquarters at Toronto, has been appointed assistant general passenger agent, with the same headquarters to succeed **C. R. Horning,** deceased; **H. F. Tilley,** general agent at Boston, will succeed Mr. Moffatt at Toronto, and **T. E. Pringle,** general agent at Montreal, will succeed Mr. Tilley at Boston.

Thomas D. Elliott, general agent for the Boston & Maine at Cleveland, has been appointed general western agent, with headquarters at Chicago to succeed **H. S. Garvey,** deceased.

William Baird, assistant European manager of the Canadian Pacific has been appointed steamship passenger traffic manager, with headquarters at Montreal, to succeed **Walter Maughan,** resigned.

The Santa Fe has announced that the title of **C. H. Morehouse,** general agent, has been changed to general agent, freight department, and that of **E. F. Burnett,** district passenger agent has been changed to general agent, passenger department. Their headquarters will be unchanged.

The Bessemer & Lake Erie has appointed **R. W. Wolford** chief of the tariff bureau. **J. J. Robinson** has been appointed assistant general freight agent with headquarters at Pittsburgh to succeed **Edward Campbell.**

J. L. Hohl, general agent of the D. & R. G. W., at Chicago, has been appointed assistant traffic manager, with headquarters at the same point. The position of general agent at Chicago has been abolished.

The Atlantic Coast Line has appointed **V. W. Lewis** general live stock agent with headquarters at Florence, S. C.

Guy T. Pettigrew, division freight agent of the Canadian National Rys. with headquarters at Montreal, has been appointed general freight agent of the Grand Trunk Western, with headquarters at Detroit.

Arthur C. Hultgren, assistant general freight agent of the Milwaukee, with headquarters at Chicago, has resigned to become assistant traffic manager of the Roxana Petroleum Corpn., with headquarters at St. Louis.

Walter C. Leese, traveling passenger agent of the Santa Fe with headquarters at Fresno, has been appointed city passenger agent at Los Angeles, succeeding **Thomas W. Moses,** deceased. **William J. Shields** has been appointed traveling passenger agent at Fresno.

The Canadian National has appointed **F. P. Nelson** division freight and district passenger agent with headquarters at North Bay, Ont.

L. E. Ayer, general agent of the Canadian National at Kansas City, has been transferred to Detroit, Mich. to succeed **H. H. Hamill** who has been appointed coal traffic agent at Detroit. Mr. Ayer will be succeeded at Kansas City by **Anthony Pick,** formerly with the Grand Trunk Western freight department at Chicago.

Bailey M. Clark has been appointed general agent of the Southern Pacific Steamship Lines, in charge of freight and passenger traffic, with headquarters at New Orleans.

The Canadian National has announced that **W. T. Paige,** traveling freight agent in the Memphis territory with headquarters at St. Louis, has been promoted to general agent, with headquarters at Memphis.

L. H. McCormick, general agent, passenger department, Chicago, of the Chicago, Rock Island & Pacific, has been promoted to assistant general passenger agent, with headquarters at the same point.

C. N. Gray, general agent at Dallas for the Denver & Rio Grande Western, has been transferred to St. Louis.

Paul S. Phenix, assistant general freight agent of the Baltimore & Ohio, with headquarters at New York, has been appointed general New England agent, with headquarters at Boston. Mr. Phenix will be succeeded as assistant general freight agent by **Harry Atkinson.**

Mechanical

The C. B. & Q. announces the jurisdiction of **G. P. Trachta,** master mechanic with headquarters at Galesburg, has been extended to include the territory deignated as the East Ottumwa division, and the jurisdiction of **H. G. Kastlin,** master mechanic, with headquarters at Creston, Ia., has been extended to include the West Ottumwa division. **W. A. Kelly,** master mechanic at Ottumwa, has been appointed assistant master mechanic, with headquarters at Ottumwa and jurisdiction over the West Ottumwa and Creston divisions. **H. C. Turner,** assistant master mechanic at Burlington, Ia., will have jurisdiction over the East Ottumwa and Galesburg divisions. The jurisdiction of **M. J. Brown,** master mechanic with headquarters at Chicago, has been extended to include the Aurora division and Eola repair track. **E. J. Cyr** has been appointed assistant master mechanic with headquarters at Aurora, with jurisdiction over the Chicago and Aurora divisions. The office of master mechanic at Aurora has been abolished.

E. H. Roy, general master mechanic of the Seaboard Air Line, with headquarters at Savannah has been appointed master mechanic of the Alabama division succeeding **H. McLendon,** transferred.

James R. Hayden, assistant superintendent of the car department of the M.-K.-T., with headquarters at Denison, has been promoted to superintendent of the car department with headquarters at the same point.

The Milwaukee announces **W. J. Johnston,** traveling engineer on the Iowa and Dakota division, with headquarters at Mason City, Ia., has been appointed acting master mechanic of that division.

The Canadian National Rys., Atlantic region, announce that the title of **W. E. Barnes,** superintendent motive power has been changed to general superintendent motive power, and the title of **G. E. McCoy** from superintendent car equipment to general superintendent car equipment.

The Canadian Pacific has announced that **F. G. Perkins,** division master mechanic on the Algoma district, with headquarters at Schreiber, Ont., has been transferred to the Brownville division of the New Brunswick district, with headquarters at Brownville Junction, Me., to succeed **R. V. Carleton,** transferred.

F. T. Vanatta, superintendent of electrical activities of the Northwestern Pacific, with headquarters at Sausalito, Calif., retired February 1 and has been succeeded by **E. H. Schaubel.**

The Pennsylvania has announced that **C. K. Steins,** assistant engineer of motive power of the eastern region will succeed **O. C. Wright** as master mechanic of the Indianapolis and St. Louis divisions, with headquarters at Indianapolis.

Civil

Guy W. Harris, acting chief engineer of the Santa Fe has been promoted to chief engineer with headquarters at Chicago to succeed **C. F. W. Felt,** deceased.

The Pennsylvania has announced that **Robert Faries,** superintendent of the Buffalo division, with headquarters at Buffalo will succeed **G. W. Snyder II,** deceased, as assistant chief engineer of maintenance, with headquarters at Philadelphia.

R. A. Hendrie, telephone engineer of

the M.-K.-T., with headquarters at Denison, Tex., has been appointed telegraph and telephone engineer of the Missouri Pacific, with headquarters at St. Louis.

A. B. Himes, assistant engineer maintenance of way and structures of the Baltimore & Ohio, eastern lines, with headquarters at Baltimore has been appointed first assistant signal engineer, with the same headquarters.

Elbert H. Dresser, president of the Polaris Concrete Products Co., Duluth, has been appointed chief engineer of the Duluth, Missabe & Northern, with headquarters at Duluth.

The Boston & Maine announces that **George K. Thornton,** assistant to engineer maintenance of way, with headquarters at Boston, has been appointed engineer of track. **John P. Canty,** division engineer, with headquarters at Greenfield, Mass., has been appointed assistant to engineer maintenance of way, with headquarters at Boston, succeeding Mr. Thornton. **Samuel P. Coffin,** division engineer at Boston, has been transferred in the same capacity to the Fitchburg division, with headquarters at Greenfield, succeeding Mr. Canty. **Timothy G. Sughrue,** division engineer of the Portland division, with headquarters at Salem, Mass., has been transferred in the same capacity to the terminal division, with headquarters at Boston, succeeding Mr. Coffin. **Robert H. Parke,** division engineer at Woodsville, N. H., has been transferred to the Portland division in the same capacity, with headquarters at Salem, succeeding Mr. Sughrue. **Henry C. Archibald,** bridge and building supervisor, with headquarters at Salem, has been appointed acting division engineer of the White Mountains-Passumpsic division, with headquarters at Woodsville, N. H.

The Pacific Great Eastern announces that **C. L. Bates,** formerly in the engineering department of the Pacific Great Eastern and the Canadian Pacific, has been appointed engineer of maintenance, with headquarters at Vancouver.

The Chicago, Milwaukee, St. Paul & Pacific announces the following changes: **M. A. Bost,** assistant engineer at Minneapolis, has been promoted to division engineer of the Iowa and Dakota division, with headquarters at Mason City, Iowa; **Peter Jenny,** assistant engineer at Milwaukee has been promoted to division engineer of the Superior division, with headquarters at Green Bay, Wis.; **Frank R. King,** assistant engineer at Milwaukee has been promoted to division engineer of the LaCrosse and northern divisions, with headquarters at Portage, Wis., and **N. F. Podas,** assistant engineer at Minneapolis has been promoted to division engineer of the Twin City terminals, with headquarters at the same point. The appointments noted are to newly created positions.

Obituary

Henry Scott Donnell, 84 years old, retired railroad construction engineer, died March 5 at Santa Cruz, Calif. He was a native of Bath, Me., and was a veteran of the Civil War. He assisted in construction of the Central Pacific Railroad, supervised construction in 1877 of a mile-long tunnel between Wrights and Laurel, in the Santa Cruz Mountains, worked on the Cow Creek Canyon road in Oregon and on the San Gabriel Transit Railroad Co. line, and built the Gunnison tunnel in Colorado and the Strawberry tunnel in Utah.

Charles Gill Martin, assistant to the general manager, eastern lines, of the Baltimore, & Ohio died at Relay, Md., February 19. Mr. Martin has been in the service of that company since 1897.

James Gorman, superintendent of sleeping, dining and parlor cars of the western region, Canadian National, died February 19 at his home in Winnipeg.

Walter Bauer, president of the Pyrene Manufacturing Co., Newark, N. J., died February 12.

Thomas B. Kirby, organizer and president from 1900 until 1916 of the Kirby Equipment Co. died February 18 at Culver City, Cal.

Thomas H. Marshall, assistant treasurer of the Denver & Rio Grande Western, died February 23 at Denver.

John C. Thurman, general auditor of the Greenbay & Western died February 27 at Wausau, Wis.

Herbert R. Wheeler, treasurer of the Boston & Maine died February 25 at his home in Brookline, Mass. Mr. wheeler had been with the Boston & Maine since 1882.

William A. Gore, general manager of the Virginian, who had been granted a year's leave of absence February 1, died at his home in Norfolk, February 24.

Harry H. Baker, special agent in the passenger traffic department of the Pennsylvania died March 8 at Jersey City, aged 63.

Fendall G. Winston, one of the founders and president from 1901 to 1904 of the Winston Brothers Construction Co., died at Minneapolis February 2.

C. E. E. Ussher, general passenger traffic manager of the Canadian Pacific died at Westmont, Quebec, February 22, aged 71.

Fred Paul Pelter, vice president and general manager of the Norfolk Southern died at his home at Norfolk, Va., February 18.

Thomas Henry Hopkirk, eastern sales manager of the American Steel Foundries, died at his home in New York, February 14.

Nelson Beardsley Burr, vice president of the St. Louis Southwestern died at his home in New York February 11, aged 58.

Malcolm H. MacLeod, formerly vice president of construction of the Canadian National died at Toronto, February 8 from heart disease.

E. A. Foos, fuel agent of the Baltimore & Ohio, with headquarters at Baltimore, died February 11.

Dr. Adolph Tyroler, for the past 25 years physician for the Santa Fe died February 14, at the Santa Fe Hospital, Los Angeles, following a short illness.

Willard Beaham, special engineer for the Erie and the New York, Chicago & St. Louis, died at Alma, Mich., February 5.

George P. H. Becker, formerly auditor of receipts of the Louisville & Nashville, died at his home in Louisville, February 7, aged 75.

E. I. Sackett, formerly division superintendent of the Boston & Albany, died at Springfield, Mass., February 14, at the age of 83 years.

Henry Root, pioneer railroad construction engineer, who built the cable car lines of San Francisco, died at his home in Oakland, February 23. He was 83 years old.

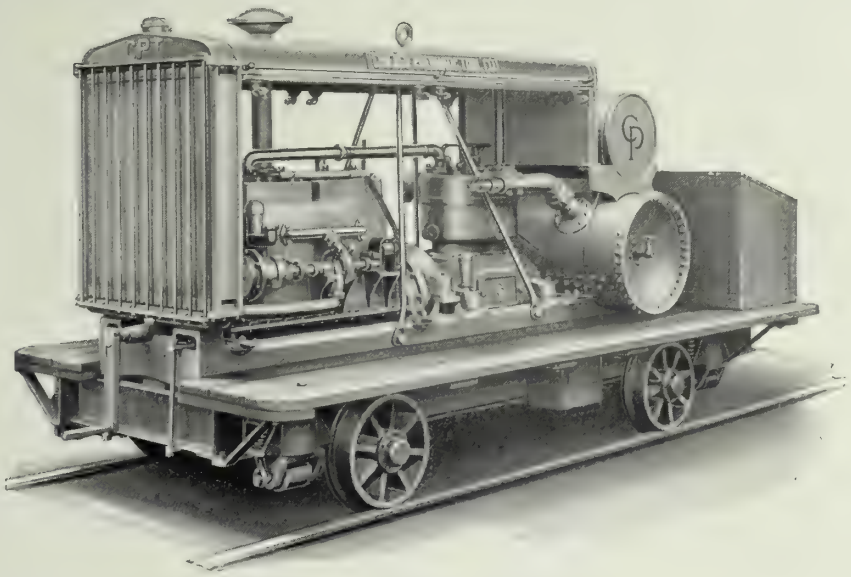
Mr. Root was a native of Vermont but came to California in the early sixties to take part in railroad construction. He retired from active work a number of years ago, and since then devoted his life to city and state engineering problems.

John R. Kenly, president of the Atlantic Coast Line, died at his home in Wilmington, N. C., March 1, aged 81. Mr. Kenly had been with that road for 43 years and had acted as its president for the last 15 years. He was born in Baltimore, Md. and was educated in the public schools there. When he was 21 he began in the employ of the Pittsburgh & Connellsville as resident engineer of construction and was with the Union R. R. tunnel, and the Richmond & Petersburg until he became superintendent of transportation with the Atlantic Coast Line in 1885. Mr. Kenly was elected president in 1913.

C. & N. W. Automatic Control

The C. & N. W. Ry. announces that automatic train control will be installed from Chicago to Omaha, approximately 500 miles, making the longest stretch of automatic control in the world.

President Fred W. Sargent said the improvement represents an expenditure of $3,000,000. The project is to be completed by May 1.



New

Ready to go—under its own power—to handle almost any railroad service job where compressed air is needed, the CP Self-Propelled Gasoline-Engine-Driven Compressor makes possible a new efficiency in railroad maintenance equipment. The standard CP Compressor with its famous Simplate Valve, Auto-Pneumatic Throttle and other exclusive features, is mounted on a truck frame carrying flanged wheels with Timken roller bearings, transverse shifting wheels, a transverse towing winch and air-operated lifting jacks. The car is propelled at a speed of 12 to 18 miles per hour, depending upon the size. The compressor is furnished in sizes of 100, 160, 220 and 310 cubic feet per minute displacement. Bulletin No. 789 completely illustrates and describes this latest CP development and will be sent on request.

CHICAGO PNEUMATIC TOOL COMPANY

RAILROAD DEPARTMENT

6 East 44th St., New York **310 So. Michigan Ave., Chicago**

Sales and Service Branches All Over the World

Supply Trade Notes

Myron F. Westover, secretary of the **General Electric Co.** for the past 34 years, has retired and will be succeeded by **William W. Trench**, assistant secretary.

Albert J. Davis, general superintendent of the **Ellington Miller Co.**, Chicago, has been appointed general manager.

J. J. Melley, master mechanic of the M-K-T, with headquarters at Parsons, Kans., has resigned and will be assistant to the president of the **Viloco Railway Equipment Co.**, Chicago.

George A. Nicol Jr., general manager of the railroad and government departments of the **Johns-Manville Corpn.** with headquarters at New York, has been elected a vice president.

The **Ziv Steel and Wire Co.**, Chicago, has elected **F. A. Lawler** executive vice president. Mr. Lawler formerly was manager of the Chicago branch of the **Crucible Steel Co.**

William Jervis, manager of the railway traffic and sales department of the **Texas Co.**, New York City, has resigned and will be succeeded by **W. E. Greenwood**, assistant manager.

E. J. Fuller, representative in the northwest district for the **Hunt-Spiller Mfg. Corpn., Boston**, has been appointed assistant sales manager, and will be succeeded in the northwest district by **D. F. Hall.**

Harry E. Cotton, formerly assistant city engineer, Omaha, has been appointed municipal engineer of the **Armco Culvert Manufacturers Assn.**, with headquarters at Middletown, Ohio.

E. T. Wade, with headquarters at Richmond, Va., representing the **Franklin Railway Oil Co.**, Franklin, Pa. has been elected vice president, with headquarters at the same point.

The **Dearborn Chemical Co.**, Chicago, has announced that **Charles M. Hoffman**, assistant to vice president, has been elected vice president.

R. R. Vinnedge, who resigned from the service of the **Galena Signal Oil Co.**, January 15, has been appointed manager of railway sales of the **Pennzoil** Co., of Oil City, Pa., with headquarters in the Graybar building, New York.

Frank K. Tutt, who entered the service of the **Bird-Archer Co.** as special representative last year, has been promoted to district manager, with headquarters in the Railway Exchange, St. Louis.

E. S. Berry has been appointed resident manager of the Canadian district of the **Union Switch & Signal Co.**, with headquarters at Montreal.

The **Minneapolis Steel & Machinery Co., Minneapolis**, has appointed **W. S. Peddie** controller, to succeed **E. A. Merrill.**

The **Standard Forgings Co.**, Chicago, announces the following changes: **C. R. Lewis**, general manager of sales, was made executive vice president also; **A. C. Stockton**, vice president and controller was elected vice president, treasurer and secretary. **L. C. Ryan**, treasurer, and **C. E. Jernberg**, secretary, have resigned. Mr. Ryan and **John T. McEnroe**, formerly vice president of the **Benjamin Colitz Co.**, will take part in the organization of the **Industrial Steel & Supply Co.**, Chicago.

The **Trumbull Steel Co.**, Warren, Ohio, has announced that **A. N. Flora**, vice president in charge of sales, has resigned.

F. Baackes, vice president and general sales agent of the **American Steel & Wire Co.**, Chicago, has been elected senior vice president. **D. A. Merriman**, assistant general sales agent, has been appointed general manager of sales. **L. H. Gray**, assistant superintendent of mills, has been appointed assistant to the president.

J. H. Waterman, formerly superintendent of timber preservation of the **Chicago, Burlington & Quincy**, has been appointed a special agent for the **Curtin-Howe Corpn.**, New York.

Herbert Mertz, vice president and sales manager of the **Orton Crane & Shovel Co.**, Chicago, has been elected vice president in charge of sales in the New York territory. Mr. Hertz will be succeeded as vice president and sales manager by **P. A. Orton, Jr.**, who has been in charge of sales in the Chicago territory. **Alex Orton**, works manager at Huntington, Ind. **C. C. Case**, Chicago, and **J. L. Kenower**, Huntington, have been elected to the board of directors.

The **E. A. Lundy Co.**, has announced that **P. M. Etters**, vice president, has resigned.

The **Canadian Ohio Brass Co., Ltd.**, has appointed **Merrill W. Manz**, manager of the railway material sales department, to the position of manager of factory and sales, with headquarters at Niagara Falls, Ontario.

J. S. Drillette, general superintendent of the **Louisville Frog & Switch Co.** has been promoted to vice president.

Stanley P. Seward, advertising manager of the **White Co.**, has been appointed assistant to **Vice President Jones** in addition to his duties as advertising manager.

The **Birdsboro Steel Foundry & Machine Co.**, Birdsboro, Pa., has named the **Fawell Engineering Co.**, Pittsburgh, Pa. exclusive representative in the Pittsburgh district.

The **Lincoln Electric Co.** has appointed **O. D. Fries** representative in charge of the consumer motor business in the Detroit territory.

H. M. Davidson has resigned as general manager of sales of the **Hayward Co.**

Donald M. Ryerson, vice president and general manager of **Joseph T. Ryerson & Son, Inc.**, has been elected chairman of the board of directors, and will be succeeded as vice president and general manager by his brother, **Edward L. Ryerson, Jr.**, who is now vice president in charge of plant operations. **Everett D. Graff** has been elected a vice president in charge of purchases.

The **Westinghouse Electric & Mfg. Co.** has announced the following promotions: **W. J. Longmore**, from general purchasing agent to consulting supervisor of purchases; **E. R. Norris**, from director of works equipment to general works manager of manufacturing operations; **A. W. Bass**, from director of works records and statistics to assistant to the vice president; **S. E. Marks**, from director of traffic and shipping to director of traffic, and **C. H. Taylor** from director of purchases to general purchasing agent. **E. C. Brandt**, works manager of the Homewood works and **F. J. Shiring**, superintendent of motor apparatus, have been appointed assistant works managers at East Pittsburgh; **J. E. Webster**, engineer of works, East Pittsburgh, has been appointed chief plant engineer; **A. E. Kaiser**, assistant manager at East Pittsburgh, has been appointed director of production for all works, and **S. C. Hoey**, superintendent of the manufacturing engineering department had been appointed works manager of the Homewood renewal parts works.

W. R. G. Baker has been appointed managing engineer of the radio department of the **General Electric Co.**, to succeed **Adam Stein, Jr.**, who has joined

CONLEY

Solid Manganese
Self Guarded

SPRING FROGS

Are giving excellent service under severe traffic conditions on Railroads using them.

Twenty years successful service by CONLEY TYPE RIGID FROGS have demonstrated their merit for safe and economical service.

SHOWING SPRING FROG IN SERVICE

CONLEY FROG & SWITCH CO.

Memphis, Tenn.

the executive staff of the **Acoustics Products Co.**

Dr. George E. Ladd, economic geologist, has been appointed consulting geologist of the **Armco Culvert Manufacturers Assn.** with headquarters at Middleton, Ohio.

George T. Johnson has been elected third vice president of the **Buckeye Steel Castings Co.,** with offices at Columbus, Ohio, in charge of sales and engineering. Mr. Johnson has been associated with this company since 1906. He is at present on the executive committee of the **Railway Supply Manufacturers' Assn.**

Bruce P. Owens, vice president of the **O'Malley-Beare Valve Corpn.,** announces that as a result of their recent reorganization, the name of the corporation has been changed to **Central Valve Mfg. Co.** The new owners of that company are putting on the market a new line of valves especially designed for railroad service. The manufacture and sale of the Multiplate and other valves and parts formerly manufactured by the old corporation will be continued.

Leeds, Tozzer & Co., Inc., 75 West street, New York, has been appointed special sales representative for the **Thew Shovel Co.** of Lorain, Ohio, and the **Universal Crane Co.** of Elyria for the eastern railways.

D. F. Miner

D. F. Miner, section engineer of the experimental section, material and process engineering department of the **Westinghouse Electric & Mfg. Co.,** has been appointed manager of the material and process engineering department.

Mr. Miner was born at Hazardville, Conn. Sept. 13, 1892. He was graduated from the Worcester, Mass. High School and entered Clark College where he was graduated in 1912. Following this he did post graduate work at Worcester Polytechnic Institute, receiving degrees of Bachelor of Arts, Bachelor of Science, and Electrical Engineering.

During the war Mr. Miner served in the coast artillery corps as second lieutenant, spending 18 months in France and Germany. During his last year of service he was captain with First Howitzer Regiment, 51st Artillery, and Third army of occupation in St. Mihiel sector.

Soon after the close of the war, Mr. Miner entered the employ of the Westinghouse Electric & Mfg. Co. as section engineer of the experimental section, material and process engineering department. While in this department he built apparatus for producing the most powerful stroke of lightning that was ever under control.

Processor Elihu Thomson, director of the Thomson research laboratory of the **General Electric Co.,** has been named a member of the American committee of the World Congress of Engineers to be held in Tokio, November, 1929. This will be the first congress of its kind, and is intended to promote international cooperation in the study of engineering science and problems.

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

For detailed description see Car Builders Cyclopedia

CLARK CAR COMPANY
BALANCED DOOR DUMP CAR
PITTSBURGH, PA.

San Francisco, Rialto Building — Minneapolis, Sexton Bldg. — Richmond, Va., Travelers Bldg.
Chicago, 557 Ry. Ex. Bldg. — New York, 52 Vanderbilt Ave. — Boston, 683 Atlantic Ave.

WHAT MANUFACTURER of Railway Supplies needs experienced and energetic representation in Chicago district?

This advertiser is now handling an outstanding account—has for years—very successfully, and can serve another advantageously to us both. Address B, C/O TRANSPORTATION, 1633 Monadnock Block, Chicago, Ill.

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Center Plates
Draw Bar Yokes
Knuckle Pins
Air Brake Pins
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Journal Box Wedges
and
Miscellaneous Forgings

Send us your specifications

Steel Car Forge Company

Pittsburgh — New York — Chicago — Baltimore

Just Completed—the Outstanding Success of the City

THE BELVEDERE HOTEL

48th Street, West of Broadway, New York City

Times Square's Finest Hotel—Within convenient walking distance to important business centers and theaters. Ideal transit facilities.

450 ROOMS —— 450 BATHS

Every room an outside room with two large windows; large single rooms size 11x6x20 with bath, $4.00 per day; for two, $5.00—twin beds, $6.00. Large double rooms, twin beds, bath, $6.00 per day. Special weekly rates. Furnished or unfurnished suites with serving pantries, $95 to $150 per month.

Moderately Priced Restaurant featuring a peerless cuisine.

Illustrated booklet free on request.

CURTIS A. HALE, Managing Director

T. W. SNOW CONSTRUCTION CO.

332 So. La Salle St. **Chicago**

NE PLUS ULTRA

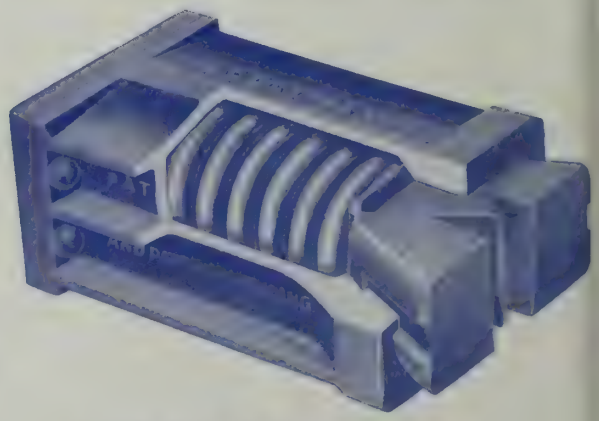
(Highbrow for "nothing further beyond")

Type L
SESSIONS-STANDARD
DRAFT GEAR
is the last word in

PROTECTION

FOR CARS AND LADING

25 years of service development
mean more than some realize



SESSIONS-STANDARD
PROTECTION
FOR CARS AND LADING

STANDARD
COUPLER CO.

NEW YORK CHICAGO

CALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industry

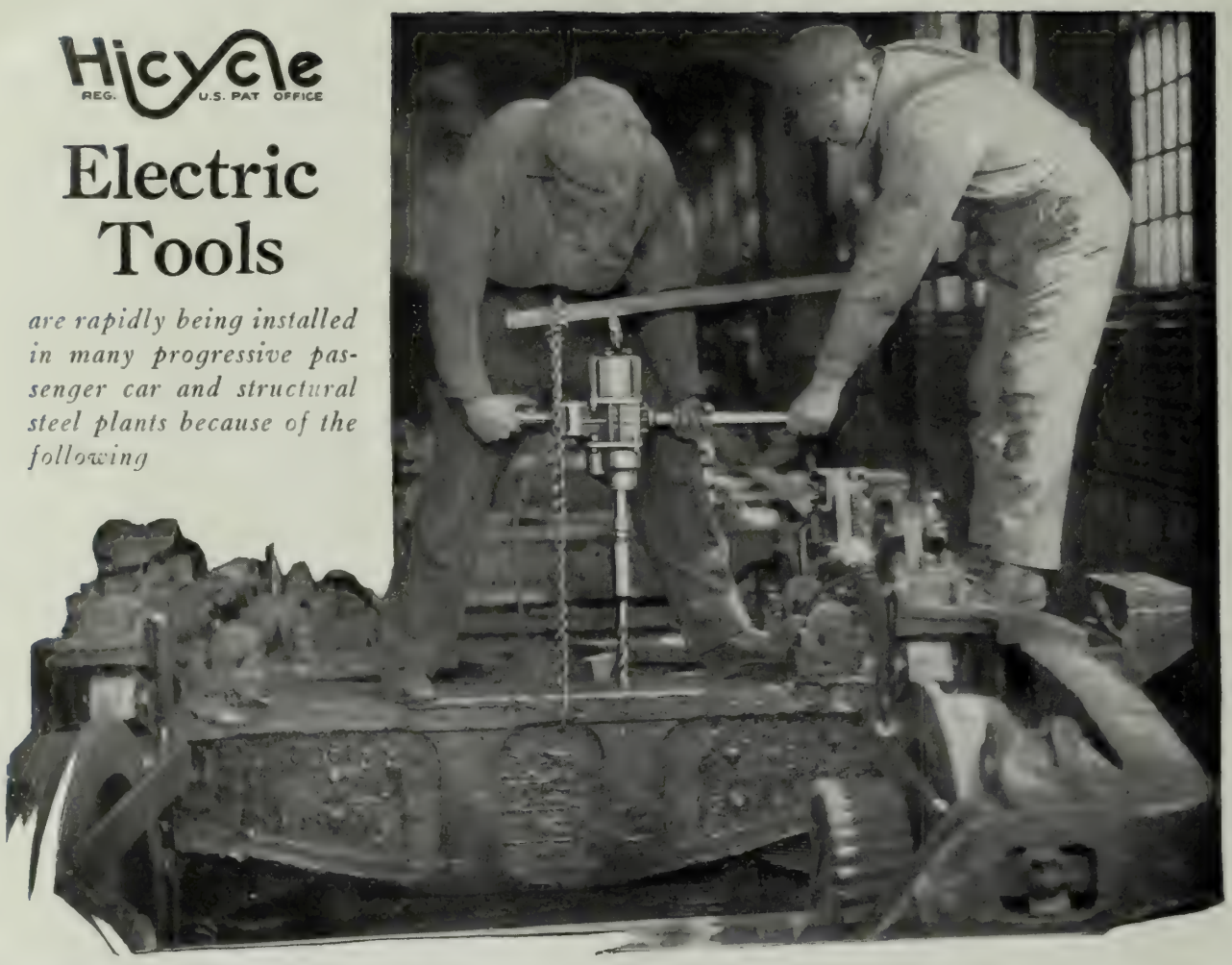
CALIFORNIA STATE LIBRARY

Vol. II April, 1928 No. 4

Hicycle
REG. U.S. PAT OFFICE

Electric Tools

are rapidly being installed in many progressive passenger car and structural steel plants because of the following



OUTSTANDING ADVANTAGES

Hicycle tools INCREASE PRODUCTION because practically constant speed is maintained at ALL loads, giving correct and safe speeds at which maximum work and life of tools, are obtained.

Hicycle tools REDUCE MAINTENANCE a third or more, compared to Universal or D.C. tools, due to

1—Absence of commutator, brushes and brush rigging.
2—Squirrel Cage Rotor, wound with bare copper, cannot burn out.
3—Oversize Ball Bearings throughout.
4—Mechanically stronger than any Universal, D.C. or 60 cycle A.C. tools of same capacity.

Hicycle tools HAVE GREATER POWER due to high sustained speed under load.

Above photograph shows a No. 1 Hicycle Drill, weighing but 23 lb., drilling ⅞ in. holes through 1 in. steel on a motor truck. (Taken in the plant of one of America's largest car builders.) A 50-lb. Direct Current Drill was formerly used for this operation.

Write for Bulletins describing Hicycle tools for drilling, reaming, tapping, grinding, buffing, sanding, screw setting and nut running.

A RECORD OF ACHIEVEMENT

Every outstanding development in Portable Electric Tools has been pioneered by Chicago Pneumatic Tool Company. Four most notable achievements are:

1904: Introduced the first portable electric tool using a fan for forced air circulation for cooling.

1908: The well known Universal Tool.

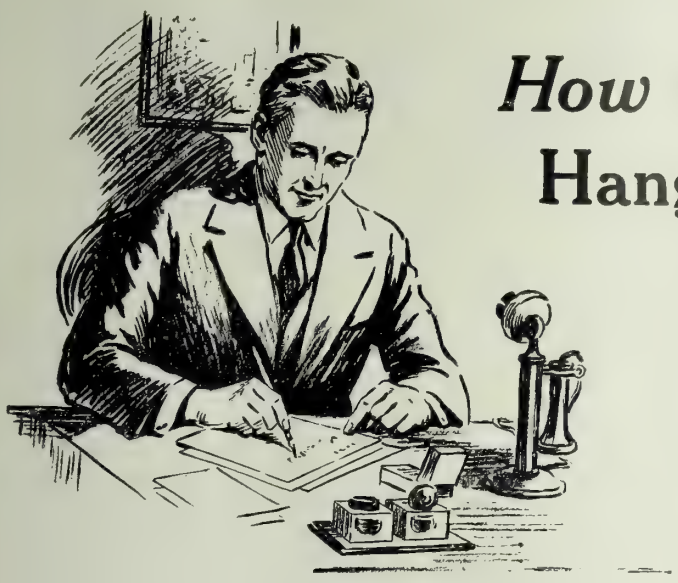
1916: The compound compensated winding for Direct Current Reamer.

1924: The latest and most important development, the High Frequency Induction Motor Tool marketed after several years of investigation and tests. This perfected tool is safeguarded for you under the trade-name—

Hicycle
REG. U.S. PAT OFFICE

1928: The "Uniloy" Jointless Rotor.

Chicago Pneumatic Tool Company



How Many Brake Beam Hangers Did *You* Buy Last Year?

AND how many are you going to buy this year?

You can reduce replacement costs by standardizing on Schaefer Drop Forged Brake Beam Hangers. They are made to last the life of the car.

Schaefer Brake Beam Hangers (and other Schaefer foundation brake gear details) are drop forged (not welded) from high carbon, wear-resisting steel.

Every hanger is heat treated and oil quenched. Note the additional metal and added strength at the bend — Schaefer Drop Forged Hangers are strongest where other hangers are weakest.

We have some interesting data on the service of Schaefer Drop Forged Brake Beam Hangers on many prominent roads. Write for complete information and illustrated bulletins.

THE RAILROAD WORLD KNOWS

Safety

Guarding life through many exclusive features specially designed for the greater safety of railroad men accounts much for Fairmont preference. They have definitely lowered the number of accidents and fatalities peculiar to railway motor cars. Practical knowledge of railroading, gained by serving one industry only, plus the experienced ideas of railroad men, made it possible for Fairmont to build products that are safer. The extra margin of safety provided is one reason why more than fifty per cent of all railway motor cars in use are Fairmonts.

FAIRMONT RAILWAY MOTORS, Inc., *Fairmont, Minn.*

DISTRICT SALES OFFICES: New York, Chicago, St. Louis, New Orleans, San Francisco, Washington, D. C., Winnipeg, Can.

BALDWIN LOCOMOTIVE WORKS, *Foreign Representatives*

FAIRMONT PRODUCTS

Section Motor Cars A2—M2—S2—M14
Inspection Motor Cars M19—MM9
Gang and Power Cars AT2—MT2—ST2
Weed Burners C(M27)—B(M27)
Ball Bearing Engines QB—PHB—PHA—QHB
Push Cars and Trailers T1—T2—T3—T20—T24
Roller Axle Bearings Ringseald—Axlsaver—Hyatt
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Improved Wheels and Axles
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SKF—For the Big Brute Jobs of Railroading

NOT
for a few months
FOR 12 YEARS
Not on a few journals
ON 25,000 JOURNALS
Not on a single Railroad
ON 35 RAILROADS
in
THIS COUNTRY
and
on the railroads
of
21 COUNTRIES
ABROAD

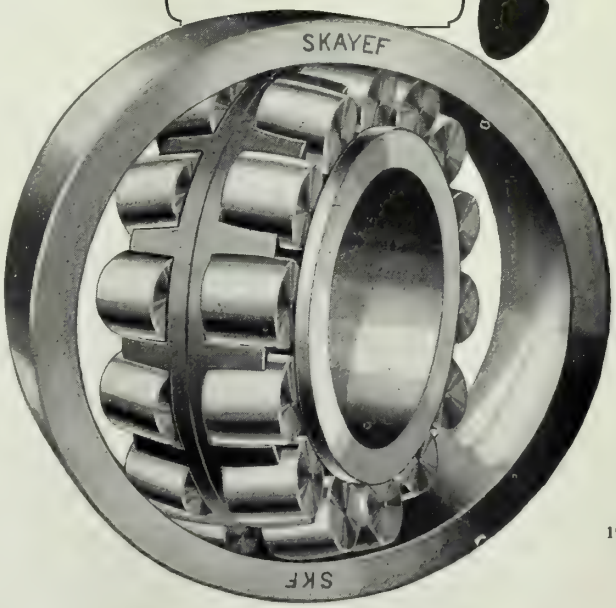
BECAUSE of their proven dependability SKF Journal Bearings were used on the Auxiliary Locomotives applied to the Missouri Pacific Mallets and Santa Fe type engines for hump-yard service. Two of these Auxiliary Locomotives are applied to the tender to increase the power and add more cars to the string that is being classified.

SKF Journal Bearings were applied to the 8½ x 16" plain journals of the six-wheel tender truck carrying a dead weight of 28,000 lbs. and take a maximum side-rod thrust of 28,000 lbs.

On Auxiliary Locomotives SKF Journal Bearings have made 150,000 miles in 3 years.

With a record of successful performance under these severe conditions it seems like an easy job for SKF Journal Bearings to serve under standard passenger equipment.

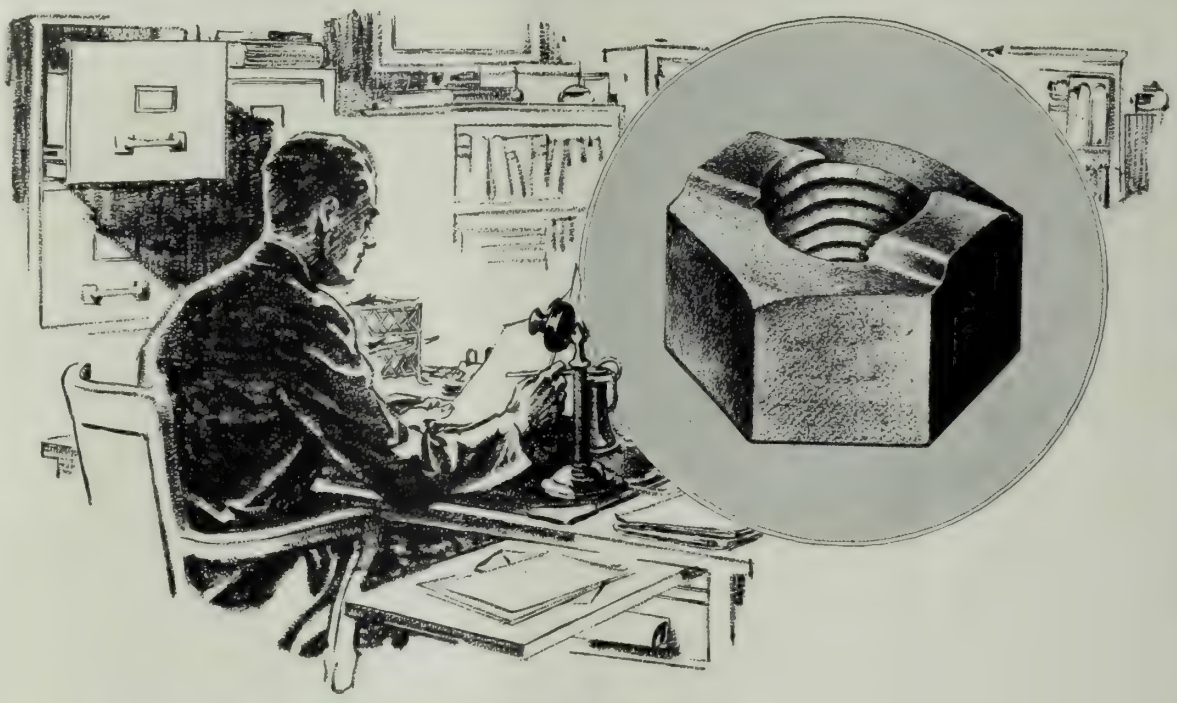
And so it is, for SKF Journal Bearings have already made nearly a million miles in such service and are still running.



SKF INDUSTRIES, INCORPORATED
40 East 34th Street, New York, N. Y.

1985

SKF
JOURNAL BEARINGS



If Customers Wrote Our Advertising

If our customers wrote our advertising, here are some of the experiences which the "ads" would relate:

" . . . . effected a saving of almost seven man-hours per car on six cars recently rebuilt in our shops, by using your Grip Unit Nut No. 3."

" . . . . saved $26 (43%), overhauling one engine, in cost of material alone, through the use of your Grip Loco Nut No. 4."

" . . . effecting a saving of 42%, in nut cost, in building these cars, and 62% for the locomotive—using Grip Nuts."

" . . . . 'bad order' equipment has been less than 2% since adopting Grip Nuts as standard."

Many of our railroad customers have been using Grip Nuts as common standard for more than 15 years. It is because a real service is being rendered that Grip Nut Company's list of customers has been growing steadily for the past 21 years.

GRIP NUT COMPANY

5917 South Western Avenue

CHICAGO, ILLINOIS

Transportation

The Monthly Magazine of the Transportation Industry

APRIL, 1928

VOLUME TWO NUMBER FOUR

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Pictures of Lowered Costs

In L. C. L. Freight Handling

No matter what your official duties if you are interested in reducing the costs of handling "in" or "outgoing" freight on your road, you will find the Mercury book " Companions of Progress" decidedly valuable.

Not only are there page after page of photographs of the Trackless Train in operation reducing costs, but there are many reports by agents verbatim as they were given to us, describing the many ways this method cuts costs.

For instance, Southern Railway Company detail how a $35,000 investment was amortized in eleven months—how this system of handling produced savings for Portland Terminal reaching $4000 per month is explained—how another road handles 1200 tons l. c. l. daily, in one terminal, and 700 tons in another with entire satisfaction, is shown.

A copy of this book should be on your desk now. Don't delay sending for it.

Mercury Manufacturing Company
4120 South Halsted Street · Chicago, Illinois

Mercury
Trackless Train

Cable Railroads Are Built to Overcome Exceptional Grades Such as That Encountered on the Lugano System. The Ascending Cars Counterbalance Those Going Down.

Some Freak Railways of Europe

Quaint Ideas of Men

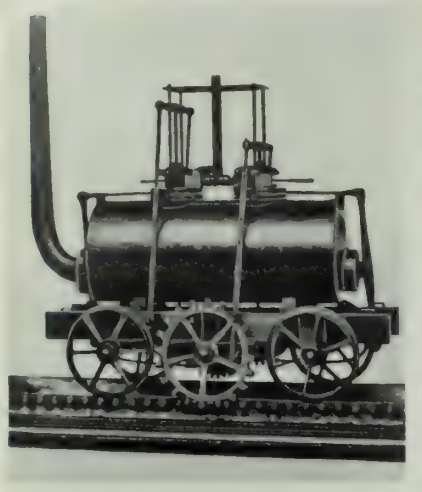
By Arthur L. Stead

RAILROADS, like human beings, in general conform to well defined and old established standards in build and appearance. Broadly speaking, few points of difference exist between one railway and another. Primarily, it is by their clothes and trimmings, slight differences in station design, engine coloring, and so forth, that we are enabled to distinguish a section of, say, the Santa Fe System from that of another transcontinental road. Thus many a traveler in our long distance trains passes over the track of a railroad other than that in whose train he is riding, in total ignorance of the fact that any change has taken place.

Quaint, indeed, are some of Europe's freak railways. Many are of inestimable utility in providing transportation for passengers and freight in districts which, for one reason or another without their aid would be almost completely cut off from the outside world. Others are nothing but toys, and expensive toys at that.

The mountainous corners of Europe provide by far the largest number of freak railroads. Europe's mountain railways fall into three classes, adhesion, rack and cable railroads. The adhesive type does not differ vastly from the ordinary standard road, except that such roads usually are of narrower gauge than main line track, and the locomotives and cars which form the trains are specially adapted for working over steep grades. In constructing locomotives for work of this character the greatest possible amount of weight is placed on the driving wheels, thus increasing the adhesion or striking power of the train on the rails. In addition, both locomotives and cars are specially built to pass freely round the severe curves which everywhere abound on roads of this type. Switzerland, above all other lands, is the home of the mountain adhesion railroad, and both steam and electric locomotives are employed in these services.

Rack railroads, the principal means whereby the iron road has conquered mountain heights, present an even more interesting



The Blenkinsop Was the First Rack Locomotive Built in 1812.

study. The rack railway had its origin more than a century ago in the Middleton Colliery railroad near Leeds, England, opened on August 12, 1812. The rack locomotive Blenkinsop, employed on this road, earned fame for all time as the world's first commercially successful railroad engine, and the world's first rack locomotive. Built by Matthew Murray, the Blenkinsop had four running wheels of 3½ feet diameter, with a cog wheel engaging in the rack outside the rail. Two 8-inch cylinders were placed vertically half within the boiler, connecting rods from these actuating the cranks, and motion being conveyed to the cog wheel by means of spurs and gear.

The rack railroad takes the place of the mountain adhesion road on particularly steep grades, where even a specially constructed adhesive locomotive could not be run with safety. Beneath a specially designed engine is placed a cog wheel fitting into the teeth of a rack rail laid on the track, thus increasing to an enormous degree the hauling and restraining power of the locomotive. The track is of more than ordinary strength to withstand the immense strain to which it is subjected, the steel ties being embedded in the ground at their lower edges to prevent the track from slipping, the rack rail usually being bolted to heavy iron supports or chairs. Instead of the running wheels driving the train, the rack road trains are virtually dragged inch by inch up the track by the operation of the cog wheel of the locomotive engaging in the rack rail. When descending, the train is in similar fashion lowered by degrees to the foot of the slope, the running wheels working loosely on their axles, and acting merely as guiders.

Among the more striking European examples of the rack railroad are the Snowdon Mountain Ry. in North Wales, the Rigi railway and the Jungfrau road in Switzerland. The Snowdon Mountain Ry. is five miles long, and climbs the steep slope of Mount Snowdon in Wales to a height of several thousand feet. About an hour and a quarter is occupied in the ascent, and the summit level of the road is the highest of any railway in Britain. The Rigi and Jungfrau rack railroads in Switzerland ascend to even greater heights, the Rigi to 4,500 feet above sea level, and the Jungfrau to 13,664 feet, this being the highest point reached by railway in all Europe. The Rigi road is operated by quaint locomotives whose fore part appears to be resting on the ground, while the rear end hangs high in the air. More than 120,000 passengers are handled yearly. The Jungfrau road is an electric rack system with overhead current transmission, and is, without doubt, the most remarkable rack railroad in the world. It is unique in that for almost its entire length it runs through tunnels cut at tremendous labor and expense out of the mountain side.

Cable railroads usually are found in places of exceptional steepness. They consist of a couple of cars to the ends of which are attached a stout cable wound round a drum at the top of the slope, one car descending as the other ascends. Cable railroads are found in Britain at Lynmouth, in North Devon, and on the cliffs at Brighton, Scarborough, and Torquay. Of continental cable roads, the Wetterhorn system, in the Grindelwold, Switzerland, is of outstanding importance.

As connecting link between the ordinary cable railroad and another unusual class of road, the overhead railway, Europe gives us the overhead cable system. No better example of this curious means of transport exists than the electric overhead cable railway connecting Bozen with Kohlern in the picturesque Italian Tyrol. The twin cars employed in this service are roomy vehicles suspended from stout wire ropes hung on steel lattice towers erected at intervals up the mountain slopes. By means of this remarkable railroad the tourist is enabled, in ease and safety, to ascend the rugged Tyrolese Alps. Overhead railroads, such as the New York overhead system, and the Liverpool Overhead Ry. in England, can perhaps scarcely be classed as railroad freaks, yet they are comparatively rare.

Out of the ordinary type of overhead or elevated railroad, there has grown in Europe a very peculiar system of haulage, the suspension of trains from a rail erected high above the ground, thus dispensing with the railroad

The Summit of Snowdon Mountain, Rack Railroad, North Wales.

track proper with its high construction and maintenance costs. Northern Germany provides an example of freak roads of this class in the curious electric overhead railroad between Barmen and Elberfeld. The trains in this service are suspended from a stout rail secured about 20 feet above ground level. The stations on the route are reached by means of wide stairways leading from the highway. The cars utilized for passengers closely resemble the stock in service on the London tube roads, themselves something in the nature of railroad freaks, and at busy periods of the day trains are made up of as many as six cars coupled together, propulsion being secured by motors in the cars.

The similarity between the curious Barmen-Elberfeld overhead railway and what is known as the Lartigue monorail system of haulage, is very close. The Ballybunion & Listowel, in southwest Ireland, is a curious road which only recently closed down to decreasing traffic. The track of this unusual railroad consisted of a single stretch of steel forming a running rail about three feet above ground level, with a guide rail placed six inches above ground level on each side of the central running rail. The locomotives and passenger cars hung on each side of the running rail in the form of an inverted "V", each locomotive really consisting of two engines combined in one with a boiler and chimney on each side. Passenger and freight cars were also of twin formation.

Fireless Locomotive Operated on Bottled Steam, Anglo-Persian Oil Company's Refinery, Llandarcy, Wales.

Toy railways abound throughout the continent. In Britain there are numerous diminutive roads over which passenger and freight trains regularly are run serving areas untapped by the ordinary railroads. The smallest systems of this type are the Ravenglass & Eskdale, and the Eaton Hall Ry., in Cheshire. Both are of 15-inch gauge, and both are operated by the tiniest steam locomotives imaginable. The Eaton Hall Ry. is a private road owned by the Duke of Westminster. The Ravenglass & Eskdale is eight miles long, and climbs into the heart of the wild mountain region of West Cumberland. After lying derelict for many years, the system was reopened in 1917, and is now worked by four miniature locomotives. The largest is a one-third full-size 2-8-2 freight locomotive named "River Esk." This locomotive can haul a 30-ton freight train or a train of 220 passengers. Passenger engines include an Atlantic and a Pacific type machine. Leading dimensions are: cylinders 4⅛ inches by 6¾ inches; driving wheels 20 inches diameter; total weight of engine and tender 2¼ tons; fuel capacity 2 cwts.; water capacity 60 gallons. Coke is utilised for firing purposes on the Ravenglass & Eskdale, owing to the necessity for avoiding smoke or sparks soiling the clothes of passengers riding in the open cars. In a single year this road has handled 22,000 passengers, 2,500 tons of freight, and hundreds of bags of postal mails.

On investigation, freak railroads prove far more numerous than commonly is supposed. In addition to the representative types of curious roads referred to, much might be written regarding the many quaint railroad systems

Electric Overhead Cable Railway in the Italian Tyrol

which sprang up during the years of the world war, such as the quaint railways operated by means of thermal storage; fireless engines laid down in certain munitions works; the speedily built and wonderfully efficient "decauville" railways worked by steam, gasoline and gas-electric locomotives, built behind the fighting line on the western front to feed the guns; and other out of the common war time transport systems.

While every railway is faced at one time or another with its own peculiar bridging difficulties, probably no railroad in the world affords finer evidence of the builder's genius than the Bombay, Baroda & Central India. This unique railway virtually is built for much of its length on bridges, and the recent reconstruction of what are known as the Bassein bridges, on the north going trunk route out of Bombay, forms a rare epic in transportation's story.

The Bassein bridges, two in number, are respectively 4,312 and 1,562 feet in length. They enable the railroad to cross Bassein Creek, an arm of the Indian Ocean, which separates the island

Screwing the Piles With the Capstan. Railway Built on Bridges.

of Salsette from the mainland of India. Between the two bridges lies the island of Panjoo, which, besides affording facilities for construction, has made possible a division of the bridging work into two independent sections which otherwise might be one continuous structure from shore to shore. To all intents both structures may be regarded as a combined work, having regard to the fact that one is merely a continuation of the other in the complete project of carrying the track across the water. Bassein Creek is tidal, and the difference between the highest and lowest tides is 15 feet. Incidentally the depth of water at the highest tides varies from 15 to 41 feet. As a result of the borings taken it was found that the bed of the creek consisted of silt, mud and sand, overlying a bed of stiff clay at depths varying from 50 to 80 feet below the surface.

The old bridges, which have now been replaced, were opened to traffic in 1864. They consisted of double spans of 60-feet Warren girders, carried on 2 ft. 6 in diameter cast iron screw piles, screwed to depths varying from 20 feet to 72 feet below bed level. The piers were at 62 ft. 6 in. centers, and each pier consisted of three piles at 14 ft. centers, braced together and surmounted by bearing girders 14 feet long. The south creek was crossed by 69 such spans and the north creek by 25 spans. The method of construction by pile screwing was a novelty at the time. For the screwing operation, a capstan was fixed to the top of the pile, having radiating poles 40 feet long, to which 16 yoke of oxen were harnessed. These walked round in a circle on rafts securely moored in the desired position.

In course of time both the girders and the foundations were found to be too weak for the increasing loads, and between the years 1896 and 1902 it was found necessary to strengthen these bridges. The original Warren girders were replaced by fish-bellied plate girders, and at the same time the foundations were strengthened by the addition of 2 ft. 6 in. diameter screw piles to each pier, one on the east side and the other on the west, and the introduction of a continuous girder over the five piles. These additional piles were screwed with a capstan having radiating arms forming a circle 12 ft. in diameter, round which two wire ropes were wound in opposite directions and the falls fastened to hand winches.

As traffic and loads continued to increase, it was found that the bridges, even if strengthened in the manner described, were inadequate, and investigations for replacing them by new structures were taken in hand. Various alternative alignments for the new bridges were considered, and eventually it was decided the new structures should be built 120 ft. each of the existing ones. They have the same number and length of spans as the old bridges, but the superstructure provides for loads of 24 tons on each of the driving wheels of a locomotive, and is sufficiently strong to take loads 50 per cent in excess of those now passing over the old bridges.

The piers are of braced cast iron screw piles. Each pier consists of six piles spaced 9 ft. centers. Five of these piles are 3 ft. diameter, with a 5 ft. 8 in. diameter cast steel blade, while the westernmost or fender pile is 2 ft. 6 in. diameter, with a 4 ft. 6 in. diameter blade. The easternmost pile, although a fender pile, is 3 ft. diameter, to allow of the future widening of the bridges when the two track road is quadrupled to meet the increasing suburban traffic. The piles are founded on the stratum of hard clay previously mentioned. It is believed that the screwing of such large screw piles to such depths has never before been attempted. In

New Bridge at the Right; Old Bridge at the Left.

order to obtain the necessary penetration, a solid nosed cast steel screw was adopted. This saved the removal of soil from the interior of the piles.

The screwing of the piles was done off barges suitably moored, four electric capstans being used. After being screwed to complete depth the piles were filled with Portland cement concrete, braced and capped to receive the main girders. These latter were assembled and rivetted complete on land and then floated into their final position. The total weight of cast iron and steel used in the construction of the bridges is about 18,000 tons. The completed structures form a rare monument to the genius of the white engineers and native subordinates employed on this gigantic work.

Agriculture's Costly Friends

The country has spent $30,000,000 and the railroads have spent $95,000,000 in the foolish project of attempting to value the railroads for the purpose of rate making. That $125,000,000 has had to go into an investigation of which less than 10 per cent of the work has been done. It should have gone into the pockets of shippers, and that is where the future millions that will be wasted in this investigation should go.

The whole matter is now in litigation and probably will be in that condition for years. But even if the investigation is completed, and the litigation ended, the valuations will not be worth much as a basis for rates, for capital must have a return if it continues to go into any enterprise and that fact will have more to do with rates than any commission's arbitrary valuation. Besides, capital is only one item in the cost of transportation.

The investigation is actually a factor in high rates, for the railroads must earn the millions it costs them and they have only one way to earn it. Moreover, the investigation inspires doubt of the future of investments in railroads and so hinders financing or makes it more costly than it should be.

The whole thing is one of the economic follies committed by friends of farmers who doubtless believed they were doing a good thing for agriculture when they legislated for valuations.

Another economic folly perpetrated by the same kind of friends is the provision that compelled packers to divest themselves of financial interest in stock yards. No good reason was ever shown for this, but as an effect of it the packers are not concerned in maintaining central markets, in fact they may have a financial interest in breaking down rather than in maintaining them.

What agriculture needs is fewer costly friends and more economic friends. — Ohio Stockman and Farmer.

Looking back over a pretty active career, I know now that the man who has enough to give himself and his family the creature comforts of modern life, and just a few of the luxuries, without any of the superfluous things intended solely for his display, is in the most ideal situation of all.—Henry L. Doherty.

Here We See the Trans-Siberian Station at Krasnoyarsk, Siberia. No. 9 Seems to Be A Bit Late This Morning.

The Trans-Siberian Stations

By Bert G. Mitchell

Generally speaking, the railroad stations on the Trans-Siberian Railroad fall into two distinct types. The small town or village station usually is built of wood, sometimes of logs, like the one at the little village of Missouvaya. Missouvaya is the last station before the wonderfully scenic Lake Baikal is reached. The stone and brick station at Krasnoyarsk is very much like the ones at Chita, Irkutsk, Novonikolaievsk, Omsk, and Ekaterinburg. These six places are the large towns or cities of Siberia.

The small stations and their platforms are lighted with kerosene lamps, but in the larger places electricity is used throughout the station. The city stations and some of the smaller ones have separate first and second class waiting rooms. Sometimes the first and second class waiting rooms are combined and separate rooms are provided for the third and fourth class passengers. Otherwise the latter wait around in the corridors or any place they can find. The ticket windows are divided in just about the same way.

The Russian is a great tea drinker. While waiting for the train he is very likely to spend the time drinking tea. Consequently the restaurants in the stations usually are larger than the waiting rooms. The restaurant keeper encourages the passenger to make himself at home and to idle over his tea.

At practically every station there are booths on the station platform. Peasants bring food in from the country and sell to the passengers from these booths. Roasted chickens and geese, cold roasts of every kind, ham and sausage, cold boiled eggs, buns of all sorts, little cakes, black and white bread, all kinds of cheese, butter and milk are among the things the peasants have to sell.

Though the fares are not high as compared with rates in America, the majority of the passengers ride third and fourth class and consequently have no access to the dining car. The peasant booths are very popular with the passengers.

Even when on the train the Russian must have his tea. For the benefit of those who do not patronize the diner almost every station is equipped with a "kipyatok" or a sort of glorified samovar. A kipyatok is a large tank with a firebox underneath for the boiling water.

As soon as the train stops at a station when the clock says it is almost time to eat, there is a rush of passengers from the third and fourth class cars. A line quickly forms in front of the kipyatok and the teapots of the passengers are filled with boiling water out of the faucet.

Usually there is only time for about half of the line to be supplied but it doesn't matter because they can get it at the next stop and at sundry other stops farther on. When the passengers return to their cars they put a little tea in their teapots and then they are ready for business.

The stopping of the train at the little Russian village station is as much of an event in the life of that community as it is in similar places in America. About the same number of leading citizens are down to see the trains in and out.

A Flash of Color

A commercial airplane with a negress opera singer as passenger alighted one morning recently in a school yard near Watsonville, Cal. The singer missed the Daylight Limited in San Francisco and had to be in Los Angeles by 8 p. m. She caught the train which arrives in Los Angeles at 7:45 p. m.

Calm and Collected

Reporter: It is said that you and your comrade, Mooney, were calm and collected after your accident at the railroad crossing.

O'Toole: Wull, it was loike this: Oi was calm and Mooney was collected.

Settling the Matter

Two women in a railway compartment were quarreling about the window and insisted on calling the guard.

"If it's opened I shall catch cold and die," said the one.

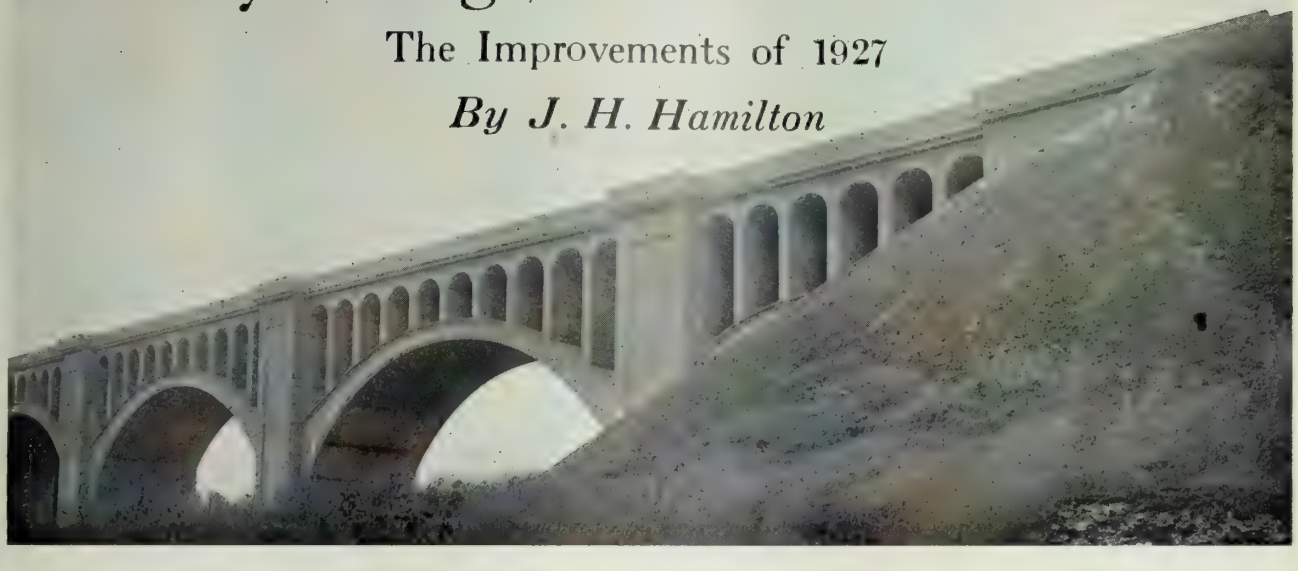
"If it's closed I shall suffocate," retorted the other.

A long-suffering man here intervened. "First open the window," he told the guard. "That will kill one. Then shut it. That will get rid of the other. Then the rest of us can all go to sleep."
—Weekly Scotsman.

Ready for Big Business on the C & E I

The Improvements of 1927

By J. H. Hamilton



DURING the latter part of 1925 the management of the Chicago & Eastern Illinois conducted an extensive survey of its freight car equipment. This survey involved the physical condition of the various types of cars, as well as the service demands for such types as the company owned at that time. As a result of this survey, it was found that certain types of coal cars, namely, flat bottom cars of small capacity, as well as the box cars of small cubical capacity were utilized for commercial loading only during periods of car shortage, and that these periods extended for but a short time every year at the most. Therefore, it was concluded to limit the repairs on all series, for which there is not a reasonably constant demand, to light or running repairs only. This policy resulted in condemning a number of inadequate cars. In 1926, 2,721 freight cars were retired. The number in 1927 was in excess of 1,100.

The management proceeded, in 1925, to provide modern freight cars, to the extent necessary to handle its traffic, in lieu of the cars to be retired. A program for building 2,000 55-ton composite gondola dump cars in its own shops was completed in 1927. Copper-content steel was used in these cars. The dump doors are equipped with latest design of door locks which prohibit any possibility of loss of contents in transit and, at the same time, permit the expeditious unloading of the cars.

The "La Salle," the C. & E. I. Flyer, 6½ Hours Chicago to St. Louis.

The facilities which the company provided at a small expense for building these cars permitted the use of the progressive system of car building similar to that used by the car manufacturing companies. The employes engaged in the construction of the cars were put under special schedules based on a daily out-put of five cars, and this schedule was made every full working day.

Prior to 1926, the company did not own any hopper cars. In order to meet the demand from some of the larger consumers of coal in this territory, a contract was awarded to an outside builder for 500 modern 70-ton cars of that type. The entire body of these cars is constructed of copper-content steel. Their cubical capacity, level full, is 2,590 feet, and the bodies are equipped with arched ends, which enables the mines to load them fully without suffering the usual losses which result from coal rolling over the ends when the cars are subjected to unusual shocks in transit.

Several years ago, the company purchased 200 modern automobile cars, all of which were equipped with end doors. In order to maintain the original ownership of this type of car, nine additional units of the same design were constructed by the company in its own shops during 1927 to replace the same number of cars previously destroyed. Special attention is given to the maintenance of these

Reinforced Concrete Highway Viaduct, 596 Feet Long, Constructed Jointly by the C. & E. I., the Illinois State Highway Commission, and Two Other Railroads.

cars, and as a result practically the entire number owned is kept in service continuously.

Recognizing the constantly increasing demand for automobile cars, the company is now preparing specifications for an additional 500 cars. These cars will conform to the most recent recommendations pertaining to automobile cars of the National Automobile Chamber of Commerce. The inside dimensions will be—length, 40 feet 6 inches; width, 9 feet clear of belt rail; height, 10 feet.

The side doors will provide for a clear opening of 12 feet, which is sufficient to permit the loading and unloading with ease of nearly all types of trucks and pleasure cars. The contract for these cars will be let as soon as the specifications are completed and bids have been received. Special attention has been given to the recommendations of the automobile manufacturers in the matter of loading devices and interior arrangement.

After acquiring the last mentioned equipment, the company's ownership of automobile cars will be 700, of which almost 30 per cent will be equipped with end doors, a larger percentage of end door cars to total ownership of automobile cars than most roads in this territory have.

The Chicago & Eastern Illinois made commendable progress in 1927. The cost of the improvements made during the year, to that part of the railway owned exclusively by the company, aggregate about $3,400,000. This amount is in addition to the sum paid for the C. H. T. T. Railroad Co. of Chicago Heights, and to the improvements made to property used by the C. & E. I. but owned jointly with other companies. Included in the latter group is the track elevation project at Kensington, Ill., the gross cost of which was about $1,800,000, of which sum the C. & E. I. paid direct $161,000 and interest charges on the balance.

In purchasing the C. H. T. T. Co., the C. & E. I. acquired the entire outstanding capital stock and in addition about 960 acres of land suitable for industrial development. The purpose of the railway company in acquiring this property was to enable it to assist more effectively in increasing the industrial development of Chicago Heights, an industrial city about 27 miles south of the center of Chicago. The terminal company operates 6.69 miles of main track and 15.38 miles of sidings, and serves over 80 industrial plants in and about Chicago Heights.

At Kensington the company completed the work of elevating two miles of track extending from Lafayette street in Kensington, in the Chicago district to 130th street, thus separating the grades where the C. & E. I. crosses the Illinois Central at Kensington, as well as eliminating a number of highway crossings.

One of Several Floodlight Towers Built in 1927 at Yard Center, Ill.

In Chicago the company completed a new elevated team yard between Twenty-third and Thirty-first streets, east of Canal street, adjacent to the wholesale and retail districts of the city; finished the extension of the inbound freight house at Twelfth and Clark streets at a cost of $33,000; new and additional freight house, 40 feet by 600 feet with an open platform, at Fourteenth and Dearborn streets at cost of $150,000.

The company also completed an arrangement whereby it is enabled to serve direct the new South Water street team tracks and fruit auction house on the Santa Fe, at Twenty-sixth street and Ashland avenue, erected new elevated platforms for handling automobiles and machinery at Evansville and Oaktown, Ind., and Papineau and Beecher, Ill. and completed the rearrangement of the Dearborn street passenger station in Chicago, the most conveniently located station in the city, to provide for the additional comfort and convenience of the road's patrons.

Terminal facilities completed in 1927 included at Wansford, Ind., a new half million dollar engine terminal consisting of a 16 stall enginehouse, machine

shop, power plant, turntable, coal chute, and water tank; an additional main track from Straight Line Junction to Akin, thus providing an additional running track between the new terminal and Evansville, Ind.; at Yard Center two new and additional forwarding tracks at cost of $52,500, thereby enabling the company more efficiently to handle the switching of southbound cars, and eliminate a number of movements over a busy paved highway; a new system of flood lighting in the yard at cost of $12,000; installation of shaving exhaust system in the planing mill; at the Mitchell yard a new 90-foot turntable at cost of $32,000, replacing an old 75-foot turntable. Two modern steel bridges at Momence, Ill., and one at Busseron, Ind., were constructed at cost of $125,000.

A new concrete overhead highway bridge 596 feet long was built at Tuscola, Ill., a concrete subway at Lyford, concrete overhead highway bridge at Oaktown, Ind., flashing light signals at ten additional highway crossings, and solid rail crossings at 19 additional highways replacing crossing planks.

The new shop and roadway machines and tools provided during the year include the following:

- 1 car wheel lathe.
- 1 car wheel press (500 ton capacity).
- 1 car wheel borer.
- 1 heavy duty double head axle lathe.
- 1 journal truing lathe.

The Company's Forces Built 2,000 of These 55-Ton Coal Cars Between 1925 and 1927.

The machines mentioned were of the latest design and were installed in the car wheel shop at Danville, replacing all the obsolete machinery in that shop. The new

One of the Many Electric Warning Signals Built at Highway Crossings.

machines are all electrically driven. The shop formerly was operated by steam. In addition, miscellaneous machines and tools were provided as follows:

- 4 new rod bushing presses for installation in the more important enginehouses.
- 1 electric tractor and crane for Danville enginehouse.
- 1 car wheel borer for Yard Center wheel shop.
- 1 triple valve test rack for Yard Center car department.
- 1 weed burning machine for roadway department.
- 70 new motor cars for use of sectionmen and car inspectors.

The company's facilities for reclaiming material were enlarged and new machinery and tools, consisting of the following, were installed:

- 1 angle cock grinding machine.
- 1 blower.
- 4 air hose mounting and dismounting machines.
- 1 suspension crane scale.
- 1 fifteen horse power motor.
- 1 single end punch and shear.
- 1 alligator shear.
- 50 ammunition truck boxes for handling scrap.

The company continued its policy of applying approved safety and fuel saving devices to its locomotives, and the following devices were applied during the year:

- 48 metal pilot beams in lieu of wooden beams.
- 27 sets Hulson grates.
- 12 sets brick arches.
- 4 sets Hoofer flange oilers.
- 3 sets Nicholson syphons.
- 12 locomotive tanks equipped with cast steel side frames in lieu of arch bar trucks.
- 50 locomotives equipped with drop seats.
- 37 additional locomotives equipped with Miller train control device.

The operation of a large number of high speed passenger and freight trains makes it necessary for the company to maintain its roadway and track in first class condition. Realizing the importance of proper drainage in track maintenance, a comprehensive program has been approved for laying drain tile at all points along the line where the track is expensive to maintain because of excessive water underground. This program involves about three years' work. Twenty-five thousand dollars was spent during 1927 to improve this condition.

The company's rail program, which was completed, called for the renewal of 5,000 tons of new

Top: New Enginehouse At Wansford, Ind.; Bottom: A Comparatively New Enginehouse At Salem, Ill.

Facilities and Methods Used in Building the Company's 2,000 New 55-Ton Coal Cars.

rail with the necessary fastenings, including 1,000 tons of additional tie plates. Rail released where new rail was laid was sawed and relayed in lighter traffic lines.

The ballast program involved an expenditure of about $100,000 for additional stone, gravel and chatt ballast.

In addition to the foregoing miscellaneous improvements to roadway, track, buildings, bridges, etc., involving charges amounting to about $100,000 in the aggregate were completed during the year. Included in this item are assessments for public improvement made by cities and towns served by the railway. An additional amount aggregating about $250,000 was spent during the year for improvements on the company's main line between Pana and Granite City. This track is used jointly with the Big Four Railroad and maintained by the latter company. The C. & E. I. will pay interest charges on this amount in accordance with the terms of the contract with the Big Four.

Typical Concrete and Steel Subway Constructed in 1927.

A Wise Amendment

"Stop, Look, Listen," is a slogan that has proved effective, but we admire the genius of the man who has made it read:

"Stop, Look—and Live."

The amended injunction is not for grade crossing and street intersections alone. It has received the magic touch which transmutes the well-known phrase into something close to poetry.—Ottawa Electric Railway News.

Some Early Engineering Accuracy

The piercing of the St. Gothard tunnel, in the Alps, the first great railroad project of its kind ever attempted along the lines of modern engineering science, was completed February 29, 1880. On that date the headings from the two sides, at Goschonen and Airolo, Switzerland, met in the center. The work of the engineers was so accurate that the two levels differed but two inches. The work was carried on at the rate of 6.01 lineal yards a day, at a cost of $715 a yard; while the Mont Cenis tunnel in the Alps, previously built by obsolete methods, had a progress of only 2.57 lineal yards a day, and at a cost of $1,130 a yard.

Women Run Railway Stations

Scotland boasts twelve women station mistresses on the principal railway and an official says, "They are most efficient."

Most of the women were appointed before the post-war railway amalgamation.

"Mind you, they are women—not flappers—and they are efficient station mistresses in every sense of the word," said the official. "They are supplied with uniforms and on the collar and cap are the words 'station mistress.' They take complete charge."—Exchange.

But It Isn't the First Cost

Ivan Rummel, mechanical engineer of Chico, Cal., needed a car in connection with business he is establishing. He visited used car places and came upon a model of ancient vintage and doubtful ability.

"How much for that one," Rummel asked.

"One dollar and a half," declared the owner.

"Sold," said Rummel.

Rummel drove to the highway and tried out his car. It went 40 miles an hour.

A One-Piece Bridge

The world's first electrical arc welded bridge was opened March 15 by the Boston & Maine at Chicopee Falls, Mass. There is not a rivet or bolt in the structure, which was fused together by intense electric heat and is in one piece, saving 33 per cent of steel tonnage by reduction of truss members, and total elimination of connecting parts.

—Wide World Photo.

Here We Have Mr. Schwab Presenting to President Needles of the Norfolk & Western the Harriman Memorial Gold Medal, for Accident Prevention in 1926.

What Industry Owes to the Workers

Pointers on Human Relations

By Charles Schwab

President, Bethlehem Steel Co.

ONE cannot reflect on the subject of human engineering without realizing the tremendous responsibility that rests upon management in guiding the destiny of mankind. Indeed we are impressed that the solution of this problem holds out a challenge to industrial statesmanship that is of paramount importance to the prosperity of our nation. It is a tribute to American industrial management that these principles have largely been recognized, and that in this country today the parties to industry generally recognize their responsibilities and opportunities.

* * *

From the problem growing out of employer-employe relationships in modern large-scale industry, let us turn now to the efforts at solution that have been made by engineers and managers in responsible control of business enterprises. I hope I may be pardoned for drawing from the experiences of the Bethlehem Steel Corp., which is only one of many industrial concerns that in recent years have taken advanced positions in this vitally important subject.

Our job primarily is to make steel, but it is being made under a system which must be justified. If in addition to manufacturing products this system does not enable

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Excerpts from an address on "Human Engineering," made by Mr. Schwab at the annual meeting of the American Society of Mechanical Engineers.

men to live on an increasingly higher plane, if it does not allow them to fulfill their desires and satisfy their reasonable wants, then it is natural that the system itself should fail.

What are these reasonable wants of employes, which they have a right to see satisfied as far as conditions of industry permit? I believe they include the payment of fair wages for efficient services; steady, uninterrupted employment; safeguarding of their lives and health, good physical working conditions; a voice in the regulation of conditions under which they work; provision for them to lay up savings and to become partners in the business through stock ownership; and finally, some guarantee of financial independence in old age.

Relations in industry have sometimes become strained over the fundamental question of wages. The area of conflict was widened because of adherence to a policy which sought to group together at a uniform wage, regardless of individual performance, large bodies of workers even though geographically widely separated. Such a policy often tended to discourage effort and to reduce individual output to a standard set by the least efficient worker.

We have traveled far in our thinking on this fundamental question of reward for service. We have come to have a new viewpoint toward the payment of wages. Our better relationships have brought a clearer understanding of the reciprocal value to national well being of a class of well paid workers whose buying power is sufficient to take the output of our mass production. We are ambitious to see our workers receive an adequate wage, a wage that is sufficient to afford a worker and his family a decent standard of living with a margin for laying something aside, but we cannot entertain any uneconomic theories as to doles or subsidies. We cannot lose sight of the fundamental law that requires full value in services for wages paid.

How to measure and relate output and wages on some fair basis has become an important function of management. We now realize the essential benefits derived from relating compensation to the contribution made by the individual, with the result that under the stimulus of measured return for service rendered there is an increasing tendency for men to take a keener interest in the business, much as if they owned it. This applies to workers as well as managers.

The economic position of our workers has become the wonder of the world. The earnings of American wage earners in terms of what they can buy are probably greater now than at any previous period in American history; certainly they are far greater than those of the workingmen in any other country of the world. In the face of these higher earnings our foreign brothers marvel at the coincidence of lower costs. The answer is that American workmen have come to realize that wages and profits are paid out of the same pocketbook and that the return to each must be proportionate to effort expended. American workmen are responding to the bid that is being made for their cooperation and realize the important factor they are in the success of the business, and they appreciate that their employers under an enlightened human relations policy are striving to provide as high wages as can be paid consistent with sound management and the safeguarding of the investment and in line with general economic conditions.

High wages do no good to the man who has no chance to earn them. Hourly and daily rates mean little to the employe who can work only a few days a month or a few months out of the year. Steady employment, therefore, ranks high among the needs of the workman. During the last few years industrial managers have been giving much thought to this question, to the elimination of the evil of unemployment. It has come to be realized that peaks and valleys of industrial activity, during which periods of feverish effort to get out products alternate with periods of idleness and stagnation, not only are undesirable from the standpoint of the workingman but are wasteful and expensive to industry and to society as a whole. Toward the leveling of these peaks and valleys much has been done by the intelligent efforts of management; perhaps even more has been accomplished as a result of the sustained purchasing power built upon high wages and of the changed buying methods of the public. This last-named element, in turn, has resulted largely from the increased capacity and reliability of both production and transportation. Thus we see the interdependence of all the elements in that intricate machine we call industry.

But even with good wages and steady employment, the workingman is likely to lack one factor essential to his fullest efficiency and greatest interest in the company by which he is employed. This factor is ownership. A sense of proprietorship affords a powerful incentive to arouse interest in the performance of work. This principle has been the motivating influence of those who have been willing to take the risk incident to the building of all business. Its application to the wage earner in industry is relatively new, yet nowhere is the whole hearted interest of human beings so necessary and vital to successful accomplishment. Recent years have seen a considerable growth in stock ownership by industrial employes. I would not minimize the possibilities of danger involved in this practice, nor would I urge every company, regardless of the character of its securities, to enlist its wage earners as partners. Under favorable circumstances, however, and with the proper safeguards against specula-

—P & A Photo.

Chicago, the World's Rail Center. This Is Only a Small Part of the Steam Transportation Activity of the City Into Which 27 Leading Railroads Enter. Picture Shows Part of the Illinois Central, Erie and Other Yards on the Shore of Lake Michigan.

tion and possible loss, stock ownership by employes may be one of the most successful incentives to thrift and to vital interest in the enterprise. We are greatly encouraged with the results of our own experience along this line. In our efforts to increase the interest of our employes in the business and at the same time to afford them a means of saving and investment, Bethlehem has for several years encouraged the employes to acquire ownership through the employes' saving and stock ownership plan.

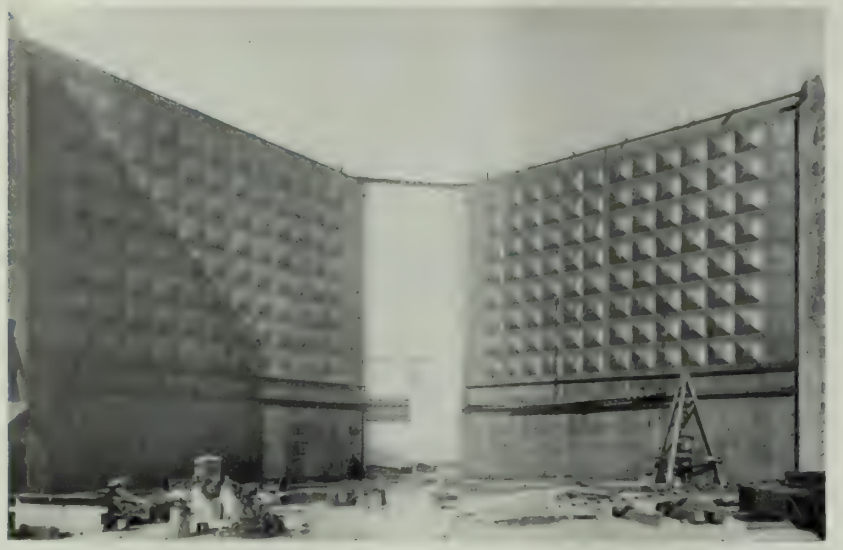
That they have enthusiastically responded to this opportunity is shown by the fact that in the short period of four years over 50 per cent of our employes have either paid or are paying for substantially 17 per cent of the corporation's stock of this class outstanding, representing an investment at par value of $17,000,000.

It is gratifying and highly significant as reflecting the present economic position of the workers that their wages have permitted them to make such substantial savings, but it is equally significant that they now have become capitalists with a financial interest in the business.

Under a plan of this kind the mutuality of interest which should exist in industry finds its greatest expression. On the one hand the company prospers because the employes strive for the elimination of waste and the better doing of their jobs, and on the other hand the employes themselves profit as the company prospers.

Successful human relations in industry recognize that the interests of employes and employers are mutual. It is recognized that as enemies they cannot long endure; they must be friends.

It is true that just as in any human relationships there are day-by-day problems arising in industrial relations which, if not settled with full justice to each, will threaten this bond of friendship. But the need for a medium for preventing or adjusting breaches in relations is not the whole objective of employes and employers. Essentially these two parties have been seeking a medium that would provide a common meeting ground. They have really been seeking for a way of living together which would permit an expression of their personality and yet cement and increase this friendship. The employe representation movement is such a constructive medium, permitting not only settlement of questions on which there is a conflict of interest, but, of even more importance, offering an unobstructed channel through which their unity of interest may be promoted.



—U & U Photo.

Look Carefully and You'll See the Man Near the Center of This Picture, Giving An Idea of the Size of These 700-Ton Steel Gates of the Locks at Lockport, Ill. They're 63 Feet High and Cost Two Million Dollars. Operated by Electricity.

Why Your Shipment Suffers

By George James

Asst. Supt. Transpn. Big Four Ry.

Much of the so-called rough handling and unlocated damage is not correctly charged. It is no more than improper loading, stowing, or bracing of the freight; in some cases, carelessness; but the greater part is due to lack of knowing how the freight should be placed to take up the shocks of transportation. Do not misunderstand me to say that we do not have rough handling of cars, for we do, some of which can be avoided, and some not. From my experience, there is reason and argument from both sides.

Shippers as a rule, are agreeable to taking steps or action, to change their loading or bracing. They welcome constructive ideas and methods for they desire their freight to reach destination in good shape. Again, they have the same difficulties the carriers have in the turnover with labor. We, as carriers, must study their methods, and assist or instruct them how to load and brace.

A lot of things have changed. Locomotives are larger; cars are larger. Today we carry from 80,000 to 110,000 pounds in a car against 30,000 to 60,000 pounds in a car in the past. Cars are of steel construction instead of wood. The difference in the equipment and the heavy increase in weight have had the effect of helping to increase damage.

In my opinion, the use of safetie loading, and key sack system of loading sacked goods, presents to us the greatest opportunity to assist in reducing damage to freight. On liquids in barrels the use of wire or steel bands has accomplished wonderful results. In fact it has nearly eliminated the loss or damage. This method is described in detail in pamphlets by manufacturers who are sellers of this idea, and tools to do the work. It will pay you if you wish to reduce this cause to give this careful thought and attention. I have used it on rubber battery boxes. With one shipper, it has reduced the breakage until there is practically none. Shippers are well satisfied, likewise consignees.

Do not overlook another feature in respect to its use, that of damage to railroad equipment. This alone is of sufficient importance to warrant the adoption of the plan.

The subject of rough handling and unlocated damage is the biggest thing we have confronting us. Some roads are attacking in one way, and others in a different way, but let us not fail to tell the other fellow what we are doing, and how we are doing it. The thought has been advanced by some, that all exception reports should be handled through one bureau or concentration head, that is, a large shipping center should be selected and a study made on all carload business originating at this point, to cover a period of three or six months, all carriers to be asked to make in detail an exception report on any damage, the report to give in detail the manner or method used in loading, how braced, what material used, wood or metal, how applied, any defects in material used, giving the defects, explain any failure, or in other words, a complete picture to be given. After the specified period has expired the reports are to be separated as to shippers, commodity, etc., and analyzed by a committee of five or more. In this way it is felt it can readily be determined what commodity is suffering the most, or with whom cars originate that are meeting with damage. When this is all determined either the carriers or bureau representative can study such loading or bracing to ascertain a better method, going, if necessary, to visit the plants of shippers of similar commodities who apparently are not having any damage. Just how to do this, or whether such a plan would be a good one is now having the attention of one of the terminal committees, and it is hoped that some good will work out of the study.

Many things are contributing to the heavy loss and damage due to these causes, signals, handling of air, cars taking up slack in train, or road, hump yards, and flat yards without riders, wrecks, and a good many other features which enter into this question, any one of which or all of them will cause trouble.

From Mules to Mechanics in Cotton

Progress at Galveston

By George W. Scott

IN THESE days of rapid transportation it is interesting to look back upon early periods of slow traffic, and note the development in the movement of freight, with its consequent reductions in cost.

The engines shown in the first illustration are used by the Galveston Wharf Co. in segregating railroad cars upon their arrival in Galveston. This equipment handled last season over 215,000 cars of cotton, grain, sulphur and general merchandise, export and import.

The early movement of cotton from the plantation to the river banks was a tedious procedure over black land roads. Often it was handled by ox teams with the old gin or flat bales placed on sleds.

The next development in cotton transportation was a one-man, one-bale, one-mule proposition, with a corresponding charge of a dollar a bale for an average haul from compress to shipside.

The improvement over the dray came with a Ben Hur arrangement consisting of three steeds from Missouri placed abreast of one another and carrying an average of 13 bales of cotton. The cotton float was lowered, so that its bed hung below the rear axle, thus providing a shorter lift in loading.

One Mule, One Man, One Bale.

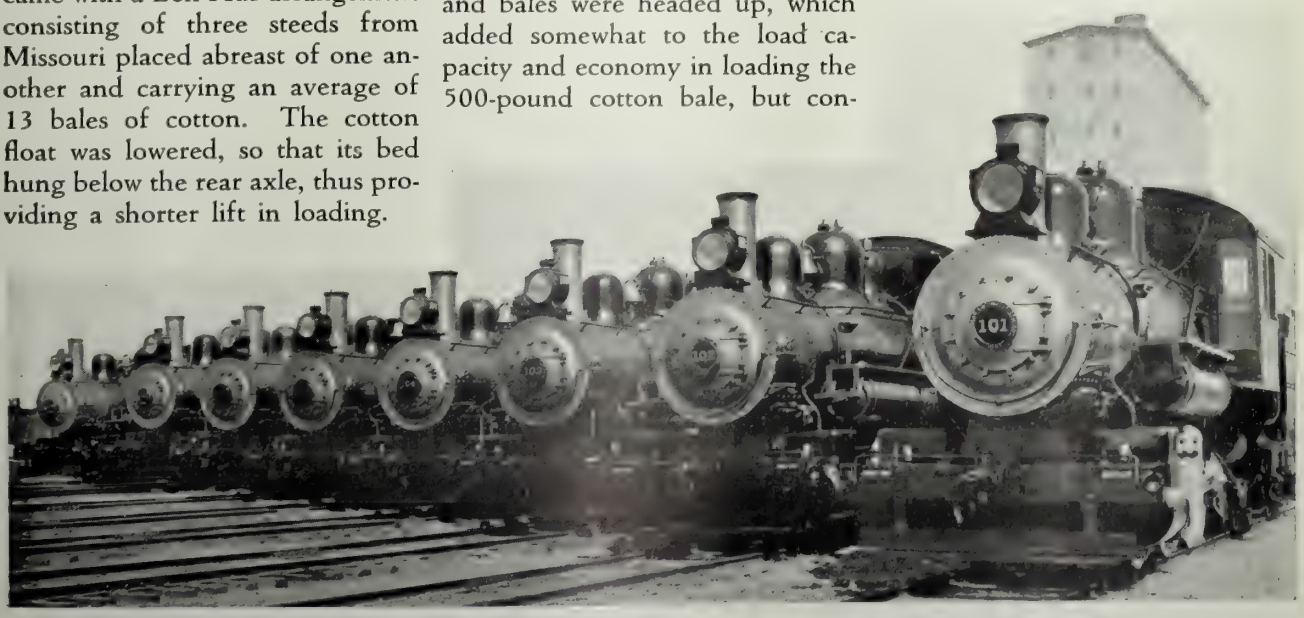
The mules were next discarded, but the cotton float was changed little in design. An auto chassis was placed under the fifth wheel. This procedure increased the load capacity only slightly, but dispatch in delivery was greatly increased. The length over all, however, was a detriment in handling a six wheel vehicle in close quarters, and no economy in loading was effected by this change in structure.

The next improvement shortened the truck length by using a Fordson tractor directly connected to the low slung body of the float and bales were headed up, which added somewhat to the load capacity and economy in loading the 500-pound cotton bale, but concentrated too much weight upon the one real axle.

The saddle back truck carrying 21 bales was the next creation, which permitted economical loading; but its length and weight were deterrent factors in its use.

The latest improvement was the tractor trailer idea, which carries a complete lot of 50 bales in a train of five. This method of transportation is the most economical of all, and permits of fairly easy loading with a well distributed load over 20 wheels, and with perfect traction can wind its load through narrow aisles and around posts in warehouses and docks. These tractors are equipped with water mufflers preventing sparks. One driver can haul twice the load of other equipment, with the advantage of handling a complete unit block of cotton, which is usually assembled in 50 or 100 bale lots for export.

The only objection to this tractor train is its use upon a public



The Battery of Switch Engines Handling Cotton and Import and Export Shipments at Galveston, Used by the Galveston Wharf Co.

The Next Improvement Was Provided by Three Trustworthy Steeds From Missouri.

highway with heavy traffic, where its length might prove a hazard.

The last illustration shows equipment, which has just completed a hauling record of over a million bales of cotton for the Cotton Concentration Co. of Galveston. This company, with its six high density compresses, is the largest handler of cotton in the world.

The transportation cost has now been reduced to 18 cents a bale on a 50-bale load unit, as against one dollar for the one-man, one-bale, one-mule unit of years ago.

How Do We Advertise?

P. Cain

Railway men are great advertisers. Insofar as their work is concerned, they do more to advertise their business than any other class of workmen. Wherever they congregate, they like to tell what they have done, what they can do, and what road in the United States is the best, in their opinion. For that reason alone, this article should be of as much interest to them as to the business men who use the magazine for advertising purposes.

Practically all of us have some hobby, if we will but admit it. When we reach middle life or later we would like to have the chance to live our lives over and put our hobby to work; that is we think we would. I admit I am one of that number. If I could make another start in life, I should apply whatever talent I have to the writing of advertising. It is real art, and a splendid profession. I never read a newspaper or magazine that I do not turn, eventually, to the advertising section and admire the makeup, and comment on the drawing power of the various advertisements. However, I do not let this desire handicap me in my work.

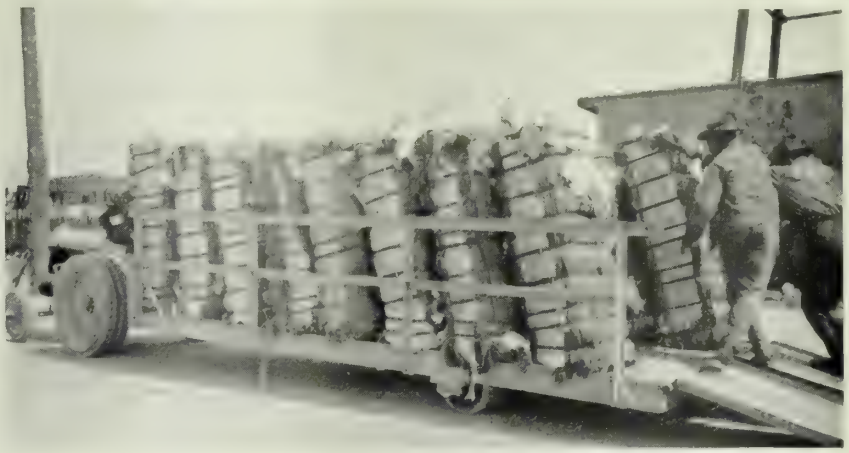
Occasionally we hear someone say he does not believe in advertising, that it does not pay. They who make such an assertion are misinformed, for the truth is, every one, from the day laborer to the men of big business, advertises, and his success depends largely on how much of it he does, and in what way. There is absolutely no way to judge the actual benefit of good advertising; what it can and does do. To have real value, it must be truthful. This applies to the man of big business, the shopkeeper, the skilled workman, the day laborer, or the man seeking employment; although only a few of the working class are aware they ever advertise.

There are two kinds of advertising, that which is paid for and that which is gratuitous. The latter is that which one gives himself by stating what he can do, or the advertising he gets through the written or spoken word of another.

The average family subscribes for, and reads several newspapers and magazines. The advertisements are always read, and particularly is this true of the woman who manages her home. She must do it in order that her expenses shall not exceed her income. She must always be on the look out for bargains. If these advertisements were not carefully read, many families, particularly those with small means, would find living much harder.

Then Came the Truck With an Auto Chassis, Making a Six-Wheel Arrangement. It Did Not Prove Economical.

Advertisements are also read by the business man, or the advertising manager. He keeps an eye on what his competitors have to offer so as to line up with them. The good advertiser never fails to make mention of the bargains he has, but in doing this, he should not extol his wares beyond the truth—to give even a little greater value would be better—for the public is taking him at his word, and expects him to deliver the goods as he advertises.



Along Came the Fordson Tractor Connected to a Low Slung Float. Weight Was Too Heavy on the Rear Axle.

The clerk or salesman should not obtain a position on misrepresentation; he sold himself on ability and his employer figured him at par with accrued interest. He is rated the moment he takes hold, and every eye in the establishment is on him, therefore he should be as efficient as represented. If he lives up to his advertising it will mean a satisfied employer, permanent work for the applicant, and a certainty of promotion. The skilled workman or day laborer seeking employment should promise and give the required number of hours of honest service, and show that he is capable of doing the work as he advertised when making his application for the job.

The word Service is emphasized by all advertisers; but many fail to follow up and see that it is rendered. The law of attraction is Service, and its absence means inefficiency; this applies to the concern as a unit as well as to the individual who is part of the unit. Too many employers are trying to lower the service standard when they should make every possible effort to raise it. It should be raised and forced to keep step with the splendid efficiency of all good business.

The general use of the word "Service" has made it one of the most abused words in the English language. Every manufacturer, every railroad, every merchant, every shopkeeper, and even the day laborer advertises Service, but many fail to give it.

Service means any work well performed for the benefit of all concerned, doing something for another that you, yourself, would expect. The word Service should never appear in an advertisement unless the advertiser positively knows it will be rendered.

Without advertising the world would be at a standstill. Advertising can be rightfully compared to a dictionary. In a dictionary we look for our mental needs, and in advertising we look for our personal and physical needs. We cannot do without either, and one should be as truthful as the other. We expect to find what we are looking for in either.

The Saddle Back Truck Carrying 21 Bales Was Next Tried But Weight and Length Proved Impracticable.

The Worth of a Handy Man

Ira Hughes, a traveling fireman for the Western & Atlantic R.R., was a handy man at home when he came in off a trip. He kept things in repair in and around the house. He worked in the garden, milked the cow, looked after the poultry, waited on the ailing when there were any, helped the children with their lessons without being grouchy about it, and in all ways, apparently, was a tip-top husband and father. Doubtless he was properly appreciated, too, which is good for a serial story by itself, because when he was knocked off the running board of an engine, one day, while crossing a creek near Chattanooga, Tenn., and killed, his wife promptly sued the railroad company for $50,000. A jury of his peers, if they were, thought Hughes was, anyhow, worth one-fifth that much, and returned a verdict accordingly. Of course the railroad company appealed, which is what legal departments are supposed to do in such cases. The suit was filed in

Georgia where the railroad lived, and a few days ago the high court of that state affirmed the judgment, and there being no other way out of it the railroad will have to hand Mrs. Hughes $10,000. But she will never find another such husband.

Maxims of Washington

Let your recreation be manful, not sinful.

Speak no evil of the absent, for it is unjust.

Be not apt to relate news if you know not the truth therefor.

Show not yourself glad at the misfortune of another, though he were your enemy.

Undertake not what you cannot perform, but be careful to keep your promise.

Labor to keep alive in your breast that little spark of celestial fire called Conscience.

The Careful Man

We are all hero worshippers of one kind or another, but when honors are being passed around and brows are being decked with garlands we pick, as our first choice, the careful man.

As modern heroes go, he probably would be found down toward the end of the line, if he could get into the line at all. Football stars, movie stars, speed demons, long distance swimmers, soldiers of fortune and other front-page celebrities would not know him if they fell over him; yet, if it were not for him, they would all probably starve to death.

He may be the president of a world-wide corporation, the keeper of the grocery, or the hired man on a lonely farm, but whatever his position or wherever his location, he is a superior worker.

He does not loaf; he finishes his task. No one has to clean up after him. If his job calls for overtime, he works overtime. If he has to do the work of others in order to keep the machinery going, he does it without grumbling. If there is danger in the line of duty, he accepts it without waiting for the camera-man. He does not splurge. He does not "grandstand." He does not look for medals. He only does an honest day's work, looking out meanwhile for himself and his family.

He keeps the world on an even keel. The careful man may not shine as a hero, but when the story is told, he stands out as the greatest of them all—one of God Almighty's noblemen.—R. G. Russell, U. P. Fire Chief, East Yard, Los Angeles.

The Pullman Surcharge

The most serious immediate threat to the earning power of the railroads is to be found in the continuing effort to abolish the Pullman surcharge. When congress reconvenes the senate will have on its calendar, with a favorable report from the senate committee on interstate commerce, a bill to prohibit the railroads from charging a greater fare for transporting a passenger in a Pullman car than in a day coach. This is the legal form which the effort to abolish the Pullman surcharge takes.

Railroad passenger service at best produces a relatively small proportion of gross revenues and a very much lesser proportion of the net operating income of the railroads. Summarized briefly, railroad passenger service in 1925 produced a little more than one-fifth of the operating revenues; took a little over one-fourth of railway operating expenses and

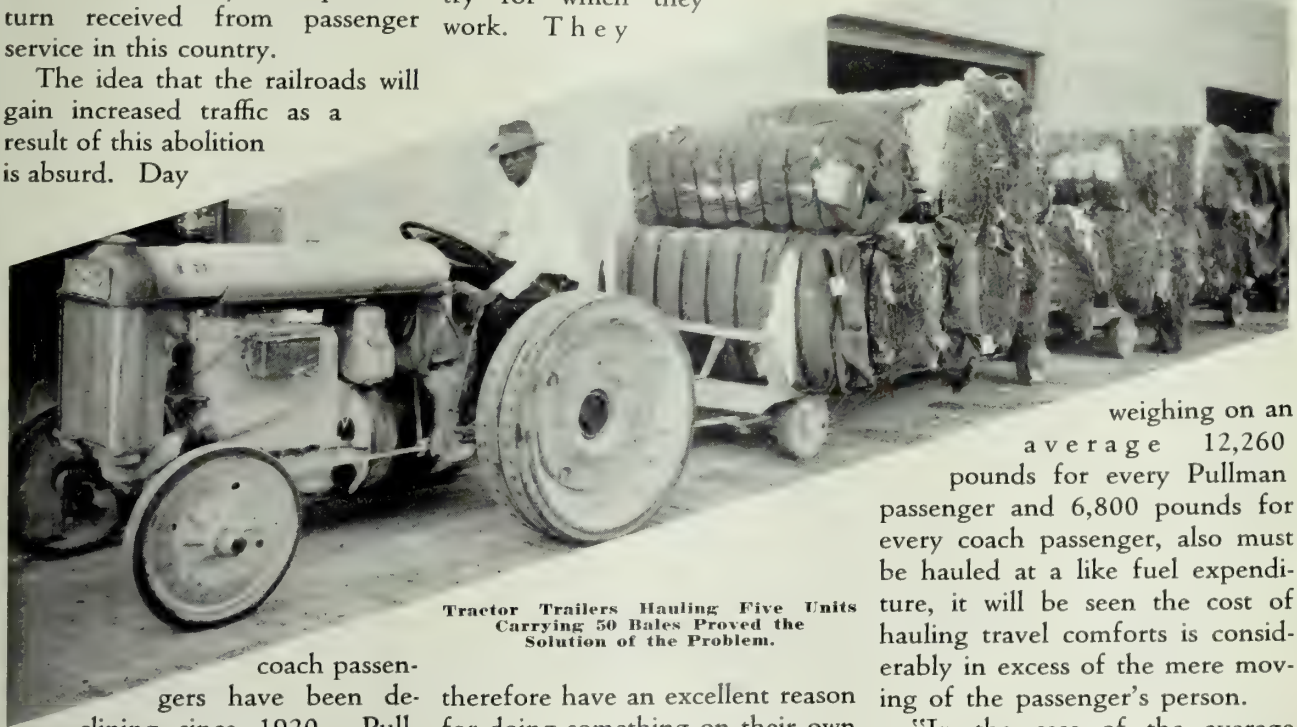
Tractors Used at Galveston in Handling Cotton Shipments.

taxes; and produced only one-eleventh of the net operating income of the railroads. This one-eleventh amounted to $111,207,000 in round numbers. The Pullman surcharge amounted to about $40,000,000, or more than one-third of the net operating income derived from passenger service. The proposal to abolish the Pullman surcharge is therefore a proposal to take away more than one-third of the already inadequate return received from passenger service in this country.

The idea that the railroads will gain increased traffic as a result of this abolition is absurd. Day coach passengers have been declining since 1920. Pullman passengers and commutation passengers are the two classes which show an increase. Commutation service at best is a public obligation, the performance of which hardly pays for itself. The one hopeful place for an improvement in passenger revenues is in the field of Pullman passengers. The traffic figures of the last five years prove conclusively that the Pullman surcharge did not prevent people from availing themselves in increasing number of the more costly service.

From the point of view of social justice the case is even stronger. With the freight service of the railroads producing ten-elevenths of the net operating income of the railroad industry, an unnecessary reduction in the net income derived from passenger service would be a substantial injustice to the shipper and consumer. It would be an equally substantial injustice to the rider in the day coach who would have to pay the railroad exactly the same fare for a less costly service.

Railroad employes are beginning to realize to an increasing extent that they have a very direct interest of their own in a decent earning power for the industry for which they work. They therefore have an excellent reason for doing something on their own account to prevent $40,000,000 being taken away from the railroads from the class of passenger travel above all others that can best afford to pay it, and which receives in return the most costly and luxurious passenger service the railroads give.—Robert S. Binkerd.



Tractor Trailers Hauling Five Units Carrying 50 Bales Proved the Solution of the Problem.

Energy in One Pound of Coal

The energy released by one pound of coal burning under the boiler of a modern locomotive is sufficient to carry a human being nearly 100 miles, according to George McCormick, general superintendent of motive power for Southern Pacific. Locomotives, as indicated by records compiled for the last year by the Class I roads, have become so relatively efficient that two and one-half ounces of coal, or its equivalent in fuel oil, will generate steam power sufficient to move one ton one mile.

"This is equivalent," McCormick said, "to carrying a 130-pound man 100 miles on one pound of coal. But as car equipment, weighing on an average 12,260 pounds for every Pullman passenger and 6,800 pounds for every coach passenger, also must be hauled at a like fuel expenditure, it will be seen the cost of hauling travel comforts is considerably in excess of the mere moving of the passenger's person.

"In the case of the average solid Pullman train the equipment a locomotive must move will weigh practically 100 times the total weight of the passengers carried. If it is a coach train the weight will be reduced by half."

If we show, by our lives, the better way to live, we have accomplished much more than if we used speech.

A dentist says he had an absent-minded motorist in his chair the other day. "Will you take gas?" he asked.

"Yeah," replied the a-m patient, "and you'd better look at the oil, too."—Boston Transcript.

One of the many advantages of crossing crossings cautiously is you get on the other side.—Insurance.

—International Newsreel.

This Pullman Has To Be Satisfied With a Lower on This Trip From New York to Australia on the Steamship Nicholson.

Talking Points for Railroaders

The railroads today provide the transportation service by which live stock is moved to the great central markets and by which the products of live stock are distributed for universal consumption.

Live stock, being easily injured, must be handled with care, and to secure advantageous markets must be moved with dispatch and without delay in transit.

The average carload of live stock is about 10½ tons as compared with 30 tons for other carload freight, the live stock car loading of revenue producing tonnage being about 35 per cent of the average of other carload traffic.

During the last decade the average carloading of carload freight other than live stock increased about 15 per cent, whereas there was no increase in the carloading of live stock.

A train made up wholly or largely of live stock carries much less revenue tonnage than trains carrying other commodities.

This results both from the light loading of live stock into cars and the necessity of speed in moving live stock to market. In most other commodities it is not necessary to sacrifice loading for speed.

In the expeditious movement of live stock it is necessary to run special trains or regular trains with only a few carloads in order to make desirable markets.

Special runs frequently are made by locomotives in gathering carloads of stock and getting them promptly under way. This is particularly true on branch lines where much live stock originates.

Live stock trains are generally scheduled to run faster than most other trains, and are given expedited movement through terminals, not only to reach the markets on time, but to avoid so far as possible, the necessity for stoppage in transit for water, feed and rest, as well as to comply with federal statutes as to the time live stock may be continuously kept in cars.

Special equipment is provided for the movement of live stock and this equipment has only limited use in the movement of other commodities.

Numerous pens for loading and unloading purposes are provided, not only at origin and destination, but at intermediate points for water, feed, and rest.

Many of the special facilities provided for live stock movement, not being adapted for use in the movement of other traffic, are idle much of the time and while idle earn nothing on the investment therein.

The carrier is required to bear the expense of loading and unloading live stock at public stock yards, and where loaded or unloaded for water, feed and rest. Most other carload freight is loaded and unloaded by the shipper.

Shippers may send caretakers with stock without paying for their transportation and free return transportation is provided where a caretaker accompanies two or more cars of live stock.

To have cars available for live stock loading requires the movement empty of large numbers of live stock cars, it being estimated that the live stock car empty movement is 82 per cent of the loaded movement, compared with 25 per cent for commodities moving in box cars.

Stock cars are bedded with sand before being used, and after being used must be cleaned. This involves a considerable expenditure by the carrier.

In the United States there is one automobile to every five inhabitants, in Afghanistan there is one to every 32,000 people.

Long Leaf and Short Leaf Stalwart Southern Pine

By

H. C. Berkes

Secretary-Manager
Southern Pine Assn.

The Tremendous Unity of the Pine, Said John Ruskin, Absorbs and Moulds the Life of a Nation.

TWENTY-five percent of the country's annual lumber production comes to its ultimate use on the railway systems of the nation. The president of the American Railway Association says 70 per cent of their supply comes to the railroads from the producing mills, while 30 per cent comes indirectly or through the hands of some intermediate manufacturer such as a planing mill or car builder. Logically, both direct and indirect purchases are included in a discussion of railway construction.

The direct and indirect uses total some 8½ billion feet of which three billion feet is Southern pine. The proportion of this lumber used to the total is somewhat larger than the proportion of Southern pine cut to the total lumber cut of the country. That long leaf and short leaf Southern pine is a popular railway lumber is further shown in the figures for one of the indirect uses of wood by railroads. Over 55½ per cent of the wood used in car construction is Southern pine.

To gain more than its proportionate share of railway use, there must be exceptional qualities in this material fitting it particularly for a variety of railway uses. These qualities, and they are exceptional, are brought out in the representative uses selected for this discussion.

Strength, both as beam and as post, ability to resist shock, and durability against decay and mechanical wear are prime requisites in bridge and trestle timbers. These qualities are important since the advent of heavy, high speed trucks, for timbers used in highway bridges and trestles as well as for those used in the heavier railway construction. The Mississippi Valley floods of 1927 disclosed a further quality in bridges and trestles of wood, which in the flooded areas probably are exclusively of Southern pine. These structures resting upon piling of the same pine stood the high waters because the torrents could not undercut the footings to cause a collapse of the structures.

Thousands of tests show Southern pine to be the strongest structural wood commercially available. For years bridges and trestles of this quality withstands the great impact of trains—and of trucks on highways—traveling at high speeds. For years the tough fibres withstand these repeated impact

This Old Illinois Central Car, Made of Southern Pine, Is Still in Service After a Quarter of a Century on the Rails.

loads without showing any separation of grain. The structural members consequently continue to act as single units, whereas a fiber separation from end to end would decrease the structural strength by 25 per cent or more.

Weights of locomotives have risen to a half a million pounds and yet this pine holds its pre-eminence for bridges and trestles. One railroad alone has 67 miles of Southern pine bridges. The trestle of creosoted pine across Lake Pontchartrain has been carrying increasing loads since 1883. It is interesting to note that railroads, a class of users that requires a structure to bring a return on the investment, build their trestles and bridges largely of wood. Highway officials would save millions of dollars of public funds if they exercised the judgment of railroad engineers instead of building monumental structures that are neither economical nor permanent. After the experience of the last decade who would be so presumptuous as to predict what traffic requirements will be a decade from now?

Of the 136 million ties purchased in 1923 by steam and electric roads, census bureau figures showed that Southern pine ties ranked second in number. Durability is still a determining factor in the selection of ties of Southern pine because, although ties generally are now treated with creosote as preservative, the greater absorptive power of Southern pine increases, in greater proportion, the natural life of such a tie. The hardness of Southern pine, with its resulting resistance to mechanical wear, is a quality fitting it to use as ties. In hardness, the softer Southern pines excel the hardest of any soft wood cut in any other region by at least 11 per cent. This hardness, and closeness of grain, is important in ties. It gives them spike-holding ability. The heavy rolling stock of today deflects even 100-pound rails and, because of variations in the hardness of soil in the roadbed, some ties receive a greater proportion of the load than others. They are called, therefore, to develop great tenacity, the utmost resistance to the withdrawal of the spikes as the rail, deflected under the load, returns, when the load has passed, to its original position.

The suitability of Southern pine for station and station platform construction is well proved. It is used for the framing of stations, for the sheathing and siding, for the floors and for the millwork. It is strong, durable and susceptible to any character of finish — paints, varnishes, stains. On station platforms of steam, electric and elevated systems the tenacious hold upon spikes is a worthy property. Desirable also is the natural durability of the wood under heavy wear and under constant exposure to weather, for such platforms have no protection nor preserving coat of any character. Many such platforms meet the hurrying feet of millions of passengers every year. Yet Southern pine makes replacement a matter of many years.

Strength and resistance to shock plus durability are the qualities that put long leaf and short leaf Southern pine into so many coaling stations.

To one who knows the practical significance of quality of Southern pine there is nothing surprising about its widespread use in the construction of freight cars. One reason why cars are made of wood is its comparative lightness. Because Southern pine is the strongest wood, a car built to a specified carrying capacity will be lighter when built of this material. But strength is not an overtowering attribute. There is its hardness to consider when specifying the flooring or decking of a car. Long leaf Southern pine has a hardness 28 per cent greater than that of the soft woods of other regions—a 28 per cent advantage in resisting the abrasive wear to which the floor of a car is subjected while being loaded, unloaded or carrying a shifting load in transit. Shifting loads call for shock resisting lining or siding. Here, it seems well to repeat that, if the shock resisting ability of long leaf Southern pine is represented by 100, the other woods run 90 for short leaf, 92 for loblolly and 77 for the closest rival of Southern pine.

Nail-holding tenacity is a needed quality in a freight car wood. In the construction of the car and

in the bracing of its contents, Southern pine holds nails, spikes and screws with a vise-like grip.

There is strain of every kind on a freight car as it weaves over the tracks, rocks on curves, bumps in flying switches. Strength, impact and shock resistance, resiliency, durability under mechanical wear and under constant exposure—these are the qualities that give Southern pine predominance in wood freight car construction. And why not freight cars of wood when they have the strength, lightness, the ease of repair that this wood gives them?

Typical specifications call for all stringers, plates, ridgepoles, purlines, framing, flooring or decking, siding, door siding, lining, roofing, fascias and running boards to be of sound grade Southern pine. A list of other uses for Southern pine on railroads would include fences, cattle guards, signs, docks, and other equipment in addition to the subjects treated more fully in this article. From the snow fence, with decay the only wear, to the box car or trestle, with demands upon every known property, Southern pine meets the varied requirements of the railroads.

A Tidal Wave Dashed Twelve Feet Above This Illinois Central Bridge of Southern Pine at Pass Manchac. Such Popularity Must Be Deserved.

The mills of members of the Southern Pine Association are cutting just as fine virgin timber today as ever grew. The lumber produced actually is better than that of a generation ago because of improved mills, better machinery, more efficient drying, more modern methods of treating and handling lumber. Many mills have adopted another practice that makes also for more satisfactory use, by consumers, of this better long leaf and short leaf Southern pine lumber. They trade-mark and grade-mark their lumber. As the idea is expressed in the publicity of the association, "You can tell it by its trade-mark. You can judge it by its grade-mark." The letters S. P. A. are the distinguishing mark of the Southern Pine Association. The mark of the specific mill that cut the plank is shown by a number within a circle. The grade-mark follows the trade-mark. These marks indicate the lumber was manufactured in accordance with American lumber standards, and that it was graded by inspectors of the association. There are 15 of these grade-marks and they are taking the guesswork out of lumber specifications and uses. It is no longer necessary to specify the highest grade in order to be sure of receiving the service required. It is not safe or economical to build of ungraded lumber.

Southern pine structural grading rules are based on tests covering a long period of years. They take into account all the known factors that influence the strength of lumber. When one remembers that, due to a difference in wood character, there may be a variation of 50 per cent in the strength values of two timbers of equal size, one realizes, also, the importance of grading on the basis of a scientific knowledge of wood character.

It has been the aim to keep this article free from technical detail. For this reason we shall not introduce here the details of Southern yellow pine standards or of structural framing. A series of technical bulletins has been prepared by the association for the use of architects and engineers and any of these may be had upon application to the association at New Orleans.

Some persons worry about the exhaustion of long leaf and short leaf Southern pine. However, a coldly calculating estimate of the situation does not disclose any cause for alarm. In the first place there are still billions of feet of standing virgin Southern pine tim-

ber. Countless millions of trees are growing bigger and better every year. Despite the enormous stand, it is true that it would some day be cut out were it not for future crops. These future crops of trees assure an unfailing supply. Basic economics gives a double assurance. Not only is it essential that we as a nation have an unfailing supply of this supreme structural wood, but it has been found that much of the cut-over land is valueless except for the growing of recurring crops of Southern pine. At least a hundred million acres of the South is worthless unless it produces long leaf or short leaf Southern pine. Cotton, corn and other farm crops have been tried upon this ground without success. But it will grow Southern pine as it has in the past. In fact, some of it already has grown its second crop.

Since reforestation began enough time has elapsed to disclose the possibility of raising, at will, a so-called second growth with a higher percentage of density than found in virgin growth. New tree growth today, with reforestation still in its infancy, is equal to about one-quarter the annual cut, and one can look forward confidently to a still larger proportion of new tree growth.

The Southern states now encourage the growth of new forests, for otherwise vast areas would be waste lands. Hogs and forest fires —the great enemies of reforestation—have been brought largely under control.

A climate favorable to tree growth prevails throughout the South—a long, warm growing season with abundance of rain. The cutting off of virgin timber in the South is not the serious matter that is the depletion of stands of northern timbers in their more rigorous climates.

In other words, the factor of rapid growth, the reproductive possibilities of great areas and the possibilities of producing by scientific management a better tree—with a higher percentage of density—gives us all the assurance we need that long leaf and short leaf Southern pine — the supreme structural wood of the world—is never to disappear from the lumber markets of the nation.

Comfortable Coaches Just Put Into Service on the D. & L. W.

New Steel Coaches on Lackawana Limited

The Lackawanna Railroad has just placed in service on its Lackawanna Limited, operating between Buffalo and New York, a new type of all steel, broad vestibule coach, equipped with two-passenger chairs designed for increased comfort for day coach traffic. These chairs are handsomely upholstered in figured mohair plush, and the back of each chair is equipped with nickeled coat and robe holders, ticket holder, umbrella loop and foot rest. The interior decorations are made to harmonize with the upholstering of the chairs, the body and chairs being finished in a restful shade of sage green while the ceiling is done in cream with stripings of gun metal blue and tan. All told this new type of car strikes a distinctive note. The car has been highly and favorably commented upon by many of those who have enjoyed its comforts. The Lackawanna contemplates building additional cars of this type for certain of its main line trains.

Speedy Trains in France

More than a mile a minute train speed is now regular schedule time for the "Sud Express" on the part of its journey from Paris to Madrid. The fast run is from Bordeaux to Dax 92 miles, on a part of the road that has been electrified.

The train daily makes the run in an hour and 29 minutes, or at the rate of 62½ miles an hour.

Much higher speeds have been attained on other electrified roads in experimental runs but the Sud Express time table, recently revised, is the fastest in France.

Up Goes Rate on Flagpoles

Two flat cars coupled in tandem to carry one piece of freight weighing only a few pounds, for which only a small tariff is charged, is too expensive a proposition for railroads to continue. So F. W. Gomph, Pacific freight tariff bureau agent, went before the California railroad commission and asked an increase in the rate on flagpoles.

"It is true," he agreed, "that transportation of flagpoles is a comparative rarity, but, who knows, an epidemic of flagpole buying might break out, and where should we be?"

A surgeon was performing an operation on a patient when a fire started in a warehouse across the street, illuminating the whole operating room. Having finished, the doctor said to the nurse: "I think the patient is coming to; you had better pull down the shade. I don't want him to think that the operation hasn't been a success!"

The naval air strength of the United States is 230 airplanes to Great Britain's 291 and Japan's 198.

Obviously, This Isn't the Electrified Section. This Is the Way Logging Is Done in Some Parts of Georgia. At Least That's What the International Newsreel Says. Now, on Page 35 We Have the Real Thing.

A Logging Road Is Electrified

Modern Methods in Lumbering

By P. B. Garrett

Gen. Eng. Westinghouse Elec. & Mfg. Co.

HIDDEN away in the heart of the white pine forests, on the eastern slopes of Mount Lassen, towering more than 10,000 feet in the background, one comes upon the picturesque town of Westwood, the center of operations of the Red River Lumber Co. Fifteen years ago the site upon which the town now stands was primeval forest. The nearest railroad was sixty mountainous miles away. Tractors, trucks, and hundreds of horses freighted in materials before the railroad came.

The Westwood plant of 1928, electrically operated throughout, is a new departure in the lumber field, with a capacity of 200 million feet a year. Modern dry-kilns handle a large part of the output, and yield perfectly seasoned lumber in a few days instead of the months required for air drying. The plant maintains its logging, sawing, manufacturing and shipping operations throughout the year. Handicaps of a severe winter climate are overcome and frozen logs are thawed in a steam-heated pond.

Westwood is in northeastern California. Nearly 25,000 cars of logs are transported every season to the mill at that place from Chester over 17 miles of standard gauge road. In addition to the main line over this distance, there are also four passing tracks 6,000 feet in length. The electrification program of the company includes these passing tracks in addition to the main line.

The changeover of this road from steam to electric operation was completed September 15, 1927. The principal electrical equipment involved consists of

two 61-ton 1500-volt Baldwin-Westinghouse locomotives, a two-unit 100 kw., 1500-volt automatic substation, and overhead line material.

Trains of loaded cars are made up and delivered to the electrified main line by steam and Diesel-electric locomotives. As an overhead system would interfere with the switching of logging equipment and the like, mounted on flat cars, steam or Diesel-electric locomotives also handle the trains from the transfer at the Westwood end of the electrification. Empty cars to be returned to the woods are handled in the same way.

The main line of the railroad is laid with 80-pound rails, is rock-ballasted and in excellent condition. Speeds of from 30 to 35 miles an hour are attained except on sharp curves. Numerous grades and curves are encountered, the maximum grade being 2.3 per cent, with more than four miles of 1.85 per cent compensated grade against load. The maximum curvature encountered is 10 degrees.

The electrical equipment is designed to deliver 160 loaded cars to the mill in two working shifts of approximately ten and one-half hours each, allowing 20 minutes at the end of each one way trip for dropping one train and coupling to another. The skeleton cars operated on the line are standard railroad equipment for logging service and weigh about 27,000 pounds without load. The cars are loaded with from 7500 to 8000 feet of lumber and average 90,000 pounds gross.

It has been the practice in the past to keep the main line in operation only nine months a year, operations being suspended during three months of winter. The mill, however, was kept in operation as usual during this period by accumulating a winter's supply of logs at Westwood. A new plan has been adopted which calls for decking the winter's supply of logs at Chester, and keeping the main line in operation to supply the mill with logs throughout the year.

The Red River Lumber Co. owns and operates power plants, both steam and hydro-electric, totaling 16,000 kva. capacity. In addition to supplying power to their own facilities, power is leased to the Pacific Gas and Electric Co. The terms of this lease, with the power requirements of the mill, limit the amount of power that may be allocated to the railroad to 1500 kilowatts; that is, there is this much power available in excess of the present total demand. Since the locomotive equipment was chosen so as not to exceed this demand, no expansion of the present plant capacity is contemplated. Under these conditions, the extra expense for supplying power to the railroad involves additional fuel for steam plant only which has been calculated to be $1000 a year.

The company's three-phase, 60 cycle, 33,000-volt power line passes the railroad at Almanor Junction. A 33-000-volt branch line has been run from this point to the single substation at the load center of the electrification. The transmission line is carried on the same poles as carry the trolley and feeder wires, every other pole being ten feet higher to accommodate the 33,000-volt line.

In the Heart of the White Pine Forests, Where the Red River Lumber Co., Operates, Is Mount Lassen Which Put on Something of a Show in Early March. This is America's Sole Surviving Active Volcano.

Here It Is. The Red River Lumber Company's Electrified Road for Logging Purposes. The Company's Headquarters Is at Westwood, California.

The two Baldwin-Westinghouse electric locomotives weigh 60 tons each. There are four driving axles, on each of which is mounted a Westinghouse type 582-FE-5 railway motor rated at 200 h.p. with forced ventilation. The motors are arranged for field control and are direct geared and axle mounted. Although each locomotive is a complete unit, the cabs are arranged for multiple-unit operation by means of train line receptacles and jumpers and a power bus line between the two units. Hence the two cabs may be coupled and operated as a single locomotive with but one engineman. Either locomotive may be operated separately.

The two cabs working in multiple will bring 20 loaded cars of logs over the 17 miles of the electrification in approximately 75 minutes, which gives a schedule speed of 13.5 mph. for the entire distance. The return trip can be made with as many empty cars as desired up to a maximum of 50 in approximately 40 minutes.

When operating on short field connections with the master controller in the full parallel position, the power peak required by 20-car trains ascending grades will be approximately 1265 kw.

From an inspection of the calculated power demand throughout the run from Chester to Westwood, it is apparent that a 1000 kw. substation, with an overload capacity of 1½ times full load for two hours and a momentary rating of 300 per cent is ample for this electrification. The substation contains two 500 kw. 750-volt shunt wound synchronous converters permanently operated in series to supply 1500 volts d-c. to the trolley. With the exception of the feature of remote starting and stopping of the unit from Westwood, the station is to be full automatic. A selector type train dispatching system now installed is utilized to provide the remote control feature.

An indicating voltmeter connected between the trolley and ground will be installed at the train dispatcher's office at Westwood to inform the dispatcher of the trolley voltage conditions. In addition, provision is made for sounding an alarm immediately should the trolley voltage drop to zero.

A single d-c. feeder, supplied through a newly developed carbon feeder breaker known as the Westinghouse "CH" interrupter, which is equipped with short-circuit detector and service restoring features, taps directly into the trolley. Short-circuit protection for the converters is provided by a 1200-ampere high-speed circuit-breaker in the positive side of the machine circuit. This breaker is equipped with a shunting resistance designed to limit the short-circuit current drawn from the station, to the commutating capacity of the converters.

A double secondary oil-insulated, self-cooled power transformer is equipped with low voltage taps for starting the converters. A tertiary winding suitable for supplying control potential for the a-c. operated automatic switching devices, is also included. The d-c. end of the converter takes its control source from the low machine potential; i.e., the control is 750 volts taken direct from the machine on the ground side.

Troubles which require the attention of the maintenance man before the station can be safely re-started, operate to lock the station out of service. This is accomplished through the medium of an annunciator lockout relay. This device is equipped with a series of targets for important devices which show at a glance the reason for the lockout.

The figures shown in the table were used as a basis in determining the feasibility of the electrification.

From these calculations it will be noted that the electrification should pay for itself in approximately three years.

For assistance in the preparation of this article, the writer is indebted to T. S. Walker of the Red River Lumber Co., whose engineering efforts have been most directly responsible for the successful culmination of the electrification program.

Estimated Investment	
2—60-ton 1500-volt locomotives	$ 72,000
1—1000-kw. 1500-volt substation with automatic switching installed	34,450
1—Distribution system—installed	76,200
5—Miles 33 kv. transmission line installed	4,000
Freight and miscellaneous expense	$192,150
Less salvage of engine No. 101	30,000
Net investment	162,150
Yearly charges—interest, depreciation and taxes	16,165
Estimated Operating Costs—Electric 9 Months	
Crew—wages	7,560
Power (extra expense only)	1,000
Maintenance of locomotive—	
Four cents per locomotive mile—97,550 locomotive miles	3,902
Operation and maintenance of substation 4¼ per cent a year on investment of $34,450	1,464
Maintenance of distribution and transmission system 3 per cent a year on investment of $82,200	2,466
TOTAL	16,392
Estimated Present Operating Costs—Steam—9 Months	
Direct expense (fuel and crew)	69,500
*Locomotive maintenance	12,000
Interest and depreciation engine No. 101	3,600
**Fires	500
Pump men	1,500
Gas, oil and repairs to pump	200
TOTAL	87,300

*Although at times three steam locomotives operate on the main line, one can almost handle the traffic if it works continuously in road service between Westwood and Chester. This item, therefore, covers the maintenance of one locomotive only.

**It is estimated that at least $500 a year will be saved by the elimination of fires now started by the steam locomotives.

Estimated Savings	
Investment for electrification	$162,150
Present costs—steam	87,300
Expected operating costs—electric	16,392
Savings	$ 70,908
Yearly charges of electrification	16,165
Net saving	54,743

Train Radio Saves Time

Radio communication between the front and rear end of long freight trains has been successfully conducted during a series of tests on the Chesapeake & Ohio Railway by the Westinghouse Electric and Manufacturing Company. These tests already have given very gratifying results, but they are being continued with the view to overcoming some of the difficulties that have been encountered.

The experiments are being conducted on long freight trains on the James River line, from Clifton Forge, Virginia, to Richmond, which follows the Jackson and James rivers along the old James River and Kanawha canal bed for a greater part of the 232 miles distance. This course has many curves, several bridges and three tunnels and is of such tortuous nature that the engine and caboose are seldom in view of each other and often are on different sides of a mountain where it is impossible to give and receive signals in the regular manner, by hand or lantern. The trains are of such length, approximately a mile long, that much time is lost waiting for the trainmen to walk within signaling distance, to enable trains to make proper movement. Thus a delay to one train delays all others and upsets the dispatcher's plans for meeting points on a line that is largely single track with sidings.

During the experiments, which have been in progress since the first week in November it is declared that the radio equipment has proved of valuable assistance, and that the crews are all anxious to stand for the runs to which the equipment is assigned.

Clear loud speaker volume is maintained, though there is some fading when passing through overhead trussed steel bridges, but not enough to destroy reception. In tunnels, the fading is more noticeable, and reaches zero when about two-thirds through, then gradually ascends again to normal volume as the outlet is reached. Fading is also perceptible along the sides of high cliffs and in deep cuts, but conversation can be maintained through the use of head phones; however, loud speaker volume is maintained at all times, other than as outlined here, or when passing between two high buildings on each side of the tracks, connected by steel bridges spanning the tracks. Plans are under way for the correction of this feature of fading. All kinds of weather, other than lightning, have been encountered, with no trouble to the communication system. Visitors from many other roads have witnessed the tests, and all have left with a statement that the reception has been more than they expected, and they were highly pleased with the performance.

Knowledge

Knowledge is the basis of all success. Not book knowledge entirely—knowledge rooted in wisdom, in judgment, in experience. Know your business, know it as well as you can possibly learn it. Know it better than anyone else knows it. Then make use of what you know. The most important requisite for success is knowledge.

Editorial Comment

The Guerilla Weapon

BY A PARTY vote the United States senate has turned down the President's re-nomination of John Esch for the Interstate Commerce Commission. Through stupidity not at all astonishing to persons familiar with the situation, the country has lost an extremely valuable public servant. The vote was a gesture of defiance for the existing administration promoted by what Woodrow Wilson would have called a little band of wilful men using what Horace Greeley denominated the guerilla weapons of political warfare.

If Mr. Esch had been an unknown quantity in public service some reasonable excuse might be found for the senate's characteristic blundering. But the man's fine record, his unquestioned ability, high intelligence, had long been established. Moreover, practically the same senate had once confirmed him. Because he neglected to vote just as a group of Southern senators thought he should have voted with respect to certain coal rates, because he had had the courage to change his opinion and his vote in the case, the senate—making a direct slap at seven other commissioners at whom it can not fire a shot just now—punishes Mr. Esch by rejecting his nomination.

Of course the merits of the coal rate case or Mr. Esch's value as a public servant sink into oblivion in contrast to the real import of the senate's action. This action very plainly advertises the fact that the senate intends to have rate cases decided its own way hereafter.

Good men are difficult to get for the money paid the members of this great body, and most of them, doubtless, do have to consider the salary. It will be safer in the future, therefore, to run over to the senate before writing decisions in rate cases. Some of the senators may have an idea or two.

Incidentally, it will be interesting to watch how union labor takes the Esch rejection. The southern mines that cost him his job are solidly non-union. Even the lame ducks might have discovered this fact.

The Humors of Life

Even on the darkest days, with floods in one part of this glorious land and 15-foot snows in another, with congress in session investigating everything except its own inadequacy; with eggs and butter fast becoming only a memory; even in the worst of times something—something—bobs up to stir a wave of laughter.

Two joyous occasions enlivened existence late last month: Los Angeles papers solemnly announced the city council had decided to select several airports. This was what an Englishman might call rather spiffy for one day, but before night fell along came a despatch from Chicago saying the aldermen in that city had determined to build subways.

Either of these stories could be sold to Judge or Life, if those publications ever begin printing humorous articles.

The Writing Impulse

Queer things, these humans. The death lists scarcely had been printed, following the dreadful disaster in San Francisquito Canyon, before newspaper and magazine offices were flooded with verse about it. And some of it was printed, too—awful drivel, most of it. Probably one of the very worst features of great disasters, railroad wrecks, storms at sea, lost aviators, is the urge they give to certain persons to write verse—poetry, they call it. Even the terrible crimes of the detestable Hickman moved numbers of moronic mentalities to express themselves in rhyme. One of the lowest forms of these cerebral outbursts made "victim" rhyme with "Hickman." While we never have advocated using "some" as an adjective we must say this is some rhyme.

Homeward, the Weary Plowboy—

There appears to be a good bit of buncombe in all this talk about the overworked farmer who is said to perspire rather freely in stirring the stubborn glebe. At all events this is what certain courageous persons have the temerity to declare, although personally we have found no particular joy in following four wilful Percherons around all day in the hot sun behind a drag harrow or pitching wheat straw up to the top of a load that seemed to be 132 feet high. If there are any especially easy jobs on a farm they never came our way. We should much prefer to work on the section with an old-time hand car.

But, disturbing as it may be, here comes T. F. Hopkins, Liberal, Kan., owner of a 2000-acre wheat farm, testifying in a grain rate hearing before the Interstate Commerce Commission, that if the average farmer worked as hard as the business man, bad times on the farm would disappear. He said there was too much "riding around the country side three-quarters of the day."

He was invited to testify because the commission learned his methods had been consistently profitable.

"We have some good farmers and lots of poor ones," he said. "Every farmer who sticks to business makes a go of it and a fair profit. Most of the

failures purchase motor cars on installment before their crops are harvested. They go riding instead of working.

"Laziness, shiftlessness and improvidence go with failure. Modern farmers have revolutionized their mode of living. Many of them live in town and drive to their farms, necessitating miles of travel."

Fine chance for Mr. Hopkins to get into an argument next time he goes after the mail.

Aurora Borealis Has Been Defeated in Canada

Railroad officials, but more especially the telegraph operators, will put the proper high value upon the "carrier current" system adopted recently by the Canadian National Rys., between Montreal and Winnipeg. American telegraphers who have worked in that region will never forget the nights when the entire line was put out of commission by the old enemy, Aurora Borealis, or earth current disturbances.

Setting aside technicalities in the interest of lay understanding, it may be said the "carrier current" system, for one thing, saves the Canadian Nationals the expense of building additional wire facilities which had become imperatively needed. Moreover, it enables the executives in Montreal to talk by telephone with their officials in Toronto and Winnipeg over wires used simultaneously for Morse telegraphy. Of course this feature is not new to persons familiar with progress in such matters, but the system just adopted has other advantages. These are, briefly, immunity from Aurora Borealis or earth current disturbances, a factor which has seriously interfered with telegraph companies for years; freedom from inclement weather conditions, such as heavy rains, wet snow and fog; elimination of mechanical repeaters with the resultant saving in wire space, and the hazard of signal distortion; utilizing existing wire plant and increasing its capacity without increasing maintenance forces and the expense incidental to the upkeep of heavy pole lines. The new system is to be extended to Vancouver.

A recent demonstration of the value of the new system was given unexpectedly, the middle of October, when earth current disturbances affected all communicating companies in Canada. While the Canadian National "carrier current" system was not completed, it was thrown into temporary service and provided facilities over which the Canadian National Telegraphs was able to operate two automatic multiplex and eight Morse circuits on the one pair of wires. The earth currents, which amounted to 200 milliamperes, completely tied up all physical wires; but the "carrier" system worked throughout with absolutely no distortion to the telegraph signals.

Experiments, conducted by Canadian National Telegraphs engineers, also gave further indication of the flexibility of the "carrier" system. These showed that when wires were grounded, and, in one instance, where even the wire was broken, the "carrier current", in the latter case, bridged the gap of its own volition and, in the former, gave uninterrupted service. Another experiment cited was where the entire pole line, wires and all, were under water during a recent flood for a considerable time and the "carrier" system worked without interruption. In each case, other circuits were useless and it was impossible to transmit messages over the physical wires.

Apart from the foregoing, the advantages of the "carrier current" are many. It can be attached to land wires, already on pole lines, without the additional cost of building new wires, and any channel, or circuit, of a "carrier" system can be utilized for multiplex, Morse duplex, or other requirement pertaining to telegraph facilities that otherwise would require heavy expenditure on outside plant, as well as providing a material saving in expense for repeater stations.

But Not for the Railroads

Just why a corporation serving the public with a property valued at $50,000,000 should be entitled to a net return of eight per cent while 5¾ per cent, which they do not get, is declared sufficient for a railroad company with three or four times that much invested always has been beyond the understanding of this observer. With an earnest ambition covering many years of careful study to get what some persons call the proper viewpoint, the justice in this strange situation continues to be a mystery. It was a great English jurist, was it not, who said the law is common sense?

In one of the hearings in Washington, last month, called to consider the consolidating of the Capitol Traction Co., the railway properties of the Washington Railway & Electric Co., the question of valuation came up before the public utilities commission. The figure set was $50,000,000 for rate making purposes, the new company stipulating a right to earn a net return of seven per cent. Omitting for brevity's sake a great deal of discussion among the interested persons, the particular item that attracts the attention of a student is found in the words of W. F. Ham, president of the Washington Railway & Electric Co. He said, according to the Electric Railway Journal:

"It would further appear that no one can question the reasonableness of a seven per cent return. The customary rate is eight per cent. There are very few instances where courts or commissions have fixed a rate of return as low as seven per cent. In a list of recent court decisions covering 23 cases, many of them United States Supreme Court cases, there is one instance of a seven per cent return, three of a

seven and one-half per cent return, and 19 of an eight per cent."

This same question was put to one of the ablest corporation attorneys in this country, a few years ago. "Why," we inquired, earnestly, "why is a street car company, or a water or telephone or light company entitled to seven or eight per cent for serving the public while a steam railroad, serving the same public, with a much larger investment at stake, is said to be entitled to only 5¾ per cent, and the rate reviewing authority declines persistently to permit rates high enough to allow even that much. In putting this question," we added with deep feeling, "we acknowledge our limited understanding of law and decisions and all that sort of thing. All we ask now is to be told just why this situation exists."

"Well," said the legal light, who chances now to be the president of a great transcontinental railroad system, "there is only one answer: It is the law."

"But," we remonstrated, "it all seems rather crazy to us. Isn't there really any way out of it for the railroads?"

"Yes," replied the attorney. "If ever the day comes when all the railroads, or even a majority of them, can get together and fight for the rights guaranteed them by the blessed old Constitution there isn't a doubt in my mind that the United States Supreme Court would knock this 5¾ per cent return into a cocked hat."

"We have always believed," we insisted, "that railroads could not be forced to provide a public service at a price below the cost. Isn't that confiscation or something?"

"O, very much so," was the comforting reply. "You can't compel them to do it, but they have to do it just the same."

There are so very many things in this world difficult to understand.

Increasing Tractive Power

If you wish to get down to bedrock, to the money effect of railroad efficiency, go to a keen-witted banker. George Roberts, vice president of the National City Bank, New York, is in this class. Mr. Roberts has been studying the railroad situation, its history and its effects on human happiness. "From 1899 to 1925, says he, "the number of locomotives on the railroads of the United States increased from 36,000 to 67,000, or 82.5 per cent, but the increase in their tractive capacity was 260 per cent; the number of freight cars increased 86 per cent, but the increase in the load capacity was 194 per cent; the number of railroad employes increased 97 per cent, but the ton miles of revenue freight handled increased by 264 per cent and the number of freight train miles increased only 22 per cent. While this was being done the working day in railroad service was reduced to eight hours. If we look for the explanation of this increase of railroad efficiency, we find that while the miles of railroad line increased only 32 per cent the capital investment increased 134 per cent. This is the immediate explanation, but back of that investment was intelligent and enterprising management, utilizing the skill and research work and inventions of engineers, chemists, scientists and leaders in every department of modern knowledge."

Economies of Air Speed

Some morning when you discover that your air mail letters apparently have taken as long to reach you as if they had come by railroad train you may be inclined to rear back and emit loud and prolonged howls of derision. Don't blame the pilots. They have done their duty. About 99 per cent of the time these men have been right on the job, night and day, rain or shine—especially at night when you were sleeping raucously in your mahogany bed—carrying the mail across this country faster than it ever has been carried in the world's history. The air mail companies are doing a marvelous work and doing it extraordinarily well.

But airplanes do not land their loads of mail at the postoffice down town. This may come, one of these days, when flat roofs are long enough, and such landings may be made safely for those in the streets below. Delays in delivery which, in some cities, are so frequent and so expensive for business now adjusted to speed, must be charged to the fact that your city either has no adequate airport or has one so far out in the country that all the time gained in the air is lost in your own postoffice delivery service. This is true in many cities. It is true today in Los Angeles which seems to be striving as valiantly for the mud turtle record in getting an airport as Chicago is doing in getting subways.

Air mail service is today the country's most conspicuous and most valuable accomplishment. In many cases its cost is insignificant. Wall Street banks get about $25,000,000 daily by air mail from out-of-town banks, thus saving interest by quick delivery. By an expenditure of $54.90 for air mail postage, a Chicago bank saved $1,700 in interest in one transaction. Kansas City banks gain $7,500 interest monthly in this way. What it means to the banks of other large cities is conjectural, but it must amount to many thousands of dollars. Add this saved interest to that gained through the exceptionally efficient service of the railroads in delivering freight and express, and you have a new viewpoint about present day business methods.

The interest on the investment, and the insurance on a trainload of silk crossing this continent amount to several million dollars in a very short time—five or six millions. Look ahead to the day when silk will be carried through the air from San Francisco or

Seattle to New York! Not at all impossible. Nothing is impossible, apparently.

Express is being carried in this country by air, and we imagine we are making a record, but between London and Paris live stock is going the same way, lions, monkeys, bears. These zoological exhibits travel de luxe in the cabins of the transchannel and Continental passenger planes.

Not long ago Phantom, a performing horse, flew from Paris to London in a specially constructed airplane compartment, and recently rare fish, sea horses and pedigreed poultry have made the same trip. There is some speculation as to what animal will make the first trans-Atlantic flight, thus breaking the record of the persistent seagull which followed the Mauretania in her fastest crossing.

What's Wrong Here?

"Educators, as well as business men, are ready to grant the slight understanding their graduates have of the practical needs of life" says a recent writer in The Forum, "and yet decade after decade goes by without any fundamental change in the system. Naturally, we have great sympathy for the educator's problem. He is struggling with a crowded course of study, with a congested student population, and with a system inherited from generations past. The modern school teacher is a victim of the system without being a party to its vices. And when we consider some of the material sent to be educated, we are ready to grant the educator a double portion of sympathy. But the inconsistency between our educational system and the requirements of practical life is a far more serious handicap to social progress than most of us have realized."

David Starr Jordan said, a long time ago, that the conventional college course handed down from generation to generation was the result of a series of compromises in trying to fit the traditional education of clergymen and gentlemen to the needs of a different social era. It met the special needs of nobody, and therefore, was adapted to all alike. The ambitious student whose tastes and desires led him into other than so-called culture studies was obliged to take the full curriculum in order to get the benefit of a small measure of the special training he desired so much, and then to depend upon other courses for fuller preparation for what he considered to be his life work. If he protested that classical studies were of no particular value to him in after life, he was obliged to console himself with the consideration that long after the declensions and conjugations had slipped out of his memory the habits of application and concentration acquired in their pursuit remain with him. The suggestion that possibly these same invaluable habits might have been acquired while delving in something useful to him was severely frowned down.

Plato said "Do not train boys to learning by force and harshness, but direct them to it by what interests their minds so that you may be the better able to discover with accuracy the peculiar bent of the genius of each."

Even if boys knew at 15 what they intended to do with their lives, which of course they do not, the system under which they are schooled still would prove wholly inadequate. In many states Latin still is a required study, but the boy entering railroad work is more likely to need arithmetic, unless he becomes a yardman where all languages are useful.

The worst weakness of the present educational system in most of the states lies in the fact that two-thirds of the pupils need personal help from teachers, and can't get it for the very simple reason that the teachers haven't the time to give them. A second wrong is in the boneheaded arrangement under which a boy is held back, and very often discouraged into giving up real effort, because of a failure in Latin or some other study for which he never will have any need. Many of these failures are caused by the fact that the boy, lacking the personal attention of the teacher, never had an intelligent idea of the study that prevents his advancement, especially Latin. The schools of Gary come nearer than almost any others in the world to the actual, common sense, practical needs of the rising generation.

If the country's schools were directed toward preparing boys for actual life the railroads would find boys better prepared in many ways for their apprentice courses. These public schools teach printing and journalism and carpentry, and how to make birdhouses and kites. Why not teach the boys to use modern machinery found in the shops of the railroads which contribute so enormously to the funds for education?

And while we are about it, why doesn't someone in authority define once more, for modern uses, just what is the purpose of education? Two billion dollars is spent every year in this country for education for 25 million school children. At present a boy spends eight years in school and college after he leaves the grades, and in most cases has to go to night school, a business college, or an apprentice school before he knows enough to earn a living. Isn't something wrong in this picture?

Two Men On a Journey

George Jean Nathan, one of the editors of the American Mercury, traveled extensively over the country recently. Returning to New York he published a disagreeable criticism of the railroads in general, his chief complaint being that they were too noisy. Think of it, from a man who had lived in New York, the noisiest city in America! Now

comes Henry L. Mencken, editor-in-chief of the American Mercury. Mr. Mencken, known almost everywhere for the facility with which he takes the negative side of practically all questions upon which everyone else in the land is most enthusiastically affirmative, has printed a glowing tribute in the New York World, praising the railroads. The piece certainly is worth reprinting:

"Of late," says the author of "Prejudices," "I have done 7,500 miles of railroad travel in the United States, chiefly on the grand, gaudy trains that demand extra fares and are outfitted with barbers, maids, stenographers, manicurists, and other such aids to a luxurious, levantine life. My general impression is that these trains are operated with immense efficiency.

"Only twice, on my whole journey, were any of them late, and one of the two was late only one minute. Inasmuch as it started from Los Angeles and ran to Chicago, it seems to me that the one minute may be conveniently forgotten: certainly I am not making any complaint about it now. The other train was delayed three hours getting into New Orleans, but that was due to a wreck, which may be set down, I suppose, to what the insurance policies call an Act of God. All the other trains I used were exactly on time. One of them pulled into El Paso from New Orleans—a vast journey across the steppes of Texas—in the precise middle of a minute."

Here are two men from the same environment, living the same lives, doing pretty much the same things every day. The difference between their impressions of a railroad journey are interesting, and give a good idea of the varying passenger moods encountered by trainmen. Under precisely the same conditions on a journey one man is grateful, appreciative, courteous. The man in the seat behind him is a grouch, constitutionally, and by natural selection. Nothing pleases him. Think of living with such a man! Consider the wives! Pity the children!

"Criticism," said Doctor Johnson, "is a study by which men grow important at very small expense."

The Positive Meet System

The rapidly increasing use of telephones in dispatching trains is making the closed station, day or night, a thing no longer to be dreaded either by crews or dispatchers. Instead of going in the hole and staying there—to use the language familiar to railroad men—the inferior direction train now calls up the dispatcher from a pole station box—if at night or at a station where there is no operator, or there is wire trouble—and gets the help he needs to take him to the next station; this rule applying on roads operating under the inferior and superior direction system. If there is no telephone and no operator to rout out of bed the train can always flag to the next station; but this, admittedly, is not particularly efficient as a means of getting over the road. Nevertheless, if the superior train has gone into the ditch or the wires are down the use of the flag will save a bad situation. Some day radio will simplify the whole matter.

The positive meet system of the New York, New Haven & Hartford and a few other roads seems to offer a safe and sensible method of operation, but it would be interesting to hear the opinions of experienced dispatchers on other lines still using the direction system. The New Haven has used the positive meet for many years with satisfactory results, but other Class I lines have, with equal success, adhered to the old methods; and both depend for safety, finally, upon human beings doing their duty.

No dispatching system ever has been devised that could not be picked to pieces; and no system seems suited to all roads. Thirty-five or forty years ago when the 31 system was adopted in issuing train orders a good many experienced dispatchers and trainmen denounced it. But they also sniffed at the ridiculous idea that dispatching ever could be done by telephone, forgetting that prior to 1851 the same attitude was taken toward the telegraph, just as the telegraphers, in their turn, laughed at the suggestion that messages might some day be handled by a "printer." But all these things are being done today.

Out of long experience in both branches of this service has come the conviction that the relative virtues of the positive meet, the superior direction or 31 system, the telephone and the telegraph are matters to be settled by the operating officials themselves. In some places, apparently, it is possible to run practically everything with a 19 form, and then again nothing at all can be accomplished with it. Men now in the service are very likely to live to see the day when trains all over the country will be run without any orders except signal direction, as is now the custom in some places. Dispatchers know, however, that human nature still has to be considered. Some crews are constitutionally unable to get over the road without delays. Some engineers would lose time falling down a well, and some, on their death beds, wouldn't feel just right if they didn't steal a little time getting out of the yard.

Railroading Then and Now

Early in the last century there were many railroad wrecks. Men were learning to handle a new power. It cost lives to learn the lesson. At the conclusion of the Civil War the situation was appalling. Railroads had been so pressed for service in transporting troops and materials that no time remained for maintenance of way or equipment. In March, 1865, Harper's Weekly said that since January 1, that year, there had been more than 50 serious wrecks, ten in the last week of February. In

three months more than 60 passengers and trainmen were killed and 500 injured. The Central Railroad owned 60 locomotives and of that number 40 were out of commission. An editorial in the same magazine said: "Rails have snapped in every direction, locomotives have been disabled, trains have been whirled from the track; cars have been crowded and uncomfortable; time tables have been utterly useless; connections seldom have been made, and trains uniformly have been delayed."

The condition of the railroads in those days had much to do with creating a public demand for governmental regulation. The press insisted upon state inspection, laws requiring tie renewals at certain periods, fines or imprisonment for railroad men. A typical editorial about "Railroad Murders," is quoted from Harper's Weekly:

> If any man thinks the legislature has no right to meddle with private affairs we should like to seat him in a car from New York to New Haven, and when the train is thundering along at 30 miles an hour, jerking and jumping from the track, and every passenger waiting for the crash, ask his opinion of the right of any company to play with human life as it is played with upon that road. Or if he is confident that every road should be left to mind its own affairs, we should like to stand him up in a car upon the New York Central from Albany to Utica, with no chance of a seat, and, reminding him that there was no chance of helping himself by the competition of another road, ask him whether he paid his fare for the privileges of discomfort, and whether the charter was granted for the public accommodation or not.

Tentacular Regulation

Someone started a story a few years ago to the effect that in the Interstate Commerce Commission Building in Washington there were hundreds, some said thousands, of tons of unexamined and wholly unnecessary reports of every imaginable and unimaginable description filed there by railroads. We have never been able to run this story to earth, and a perfectly excusable dislike for riots has kept us from asking any of the commissioners about it. Many responsible railroad men have insisted the yarn is true, and in support of their belief, have reminded us that railroad reports numbering many hundreds are sent the commission every week, entailing clerical labor costing millions of dollars every year, and that this has been going on for 40 years.

We had about forgotten this old story when along comes the nation's Thursday feast of literature from Philadelphia with a piece entitled "The Confessions of An Efficiency Expert," and here we find this delicious reminder:

"When the Interstate Commerce Commission first started to tell the railroads how to keep accounts, its experts compiled a charge register with 130 columns. They insisted on its use until the railways pleaded for time to breed a special kind of clerk who could walk twenty or thirty miles a day and also keep books. For their clerks at the end of a day looked like the tail of a Marathon race.

"The federal government and—following its lead—all the state governments have during the past ten or fifteen years gone in ardently for the collecting of useless information."

How About Parking Space in 1950?

Ultimately, if pedestrians are to have any chance at all in American cities, it will become necessary for motorists to park their cars at the city limits, or at least farther from congested business centers, and travel to offices and stores in buses and the street cars. According to a survey made by the Goodrich Rubber Co., recently, there were 23,579,002 motor vehicles registered in the United States in 1927. New York state led with 1,974,722 motor vehicles and California was a close second with 1,703,685. Other much motorized states were Pennsylvania, 1,598,-030; Ohio, 1,592,722; Michigan, 1,140,455; Illinois, 1,444,835, and Texas with 1,113,528.

Taking the registration total and dividing it into the estimated population of the United States shows one car for every 4.9 persons. The 1927 registration total also provides 7.9 motor cars for every square mile of area in the United States.

The Wonders of Science

It seems difficult some times to realize that commonplace events of today would have been regarded as poor kind of fiction 25 years ago. Phineas Fogg's journey around the world in 80 days was a dreadful bit of hokum, in the opinion of the wise men of that day. The globe trotting of George Francis Train and Nellie Bly had the whole world worked up. The telephone and the incandescent lamp were unknown in the boyhood of men still young. Now the air mail and express goes from coast to coast in 30 hours. A hundred miles an hour is ordinary speed, and 300 has been exceeded within the last few weeks. And now comes C. H. Rosenthal of Dresden, Germany, with a motor engine which he declares will give a speed of 800 miles an hour, and that a trip from London to America in four or five hours will be realized shortly. The new motor is the invention of Arno Boerner of Dresden, a German with a reputation for doing things right.

The engine is described as a "three-chamber motor cylinder" and it is said converts a single cylinder into three each with inlet, exhaust and spark plug, giving enormously increased power which will enable an oversize propeller to be used on an airplane.

"The existing dangers of a trans-Atlantic flight," said Mr. Rosenthal, "are air pockets and storms. If we can build an airplane powerful enough to rise above the zone where these occur the dangers will be eliminated and in the rarefied air of the upper levels immense speed is possible.

A Logical Combination, But——

The Great Northern and Northern Pacific wish to buy the Minneapolis & St. Louis Railroad, and have asked the Interstate Commerce Commission for authority to make the deal. While the proposal is interesting and its realization might straighten out a lot of operating kinks in the Twin Cities, it isn't likely to be completed unless the two northwestern companies change their minds about the price. The bondholders have some ideas to express.

The Minneapolis & St. Louis is a much more important property than is generally supposed. It is 1628 miles in length, runs through exceedingly productive territory in Minnesota, South Dakota and Iowa, and has connections with several great systems, among them the Illinois Central, the Wabash, the Great Northern and Northern Pacific and the Chicago Great Western. It owns some of the most valuable terminal property in the Twin Cities, is in many ways a desirable railroad, and moreover, is manned by an exceptionally loyal staff of employes who have done about everything that men could do, to the point of self-sacrifice, to make it pay. The great wonder is that the Illinois Central failed to get possession of this line long ago.

The proposal for the purchase of this line directs attention to several points of more than usual interest. For one thing, it affords a striking example of the disastrous effects of government misdirection. The road has been in receivership since July, 1923. It would have been out of the court's hands long ago if the Interstate Commerce Commission had obeyed the plain mandate of the Transportation Act of 1920 to make rates high enough to yield a fair return and at the same time provide proper transportation facilities for the country. Indeed it never would have been in receivership if this law had been obeyed.

This road, like others in the world's bread basket, depends pretty largely on grain for its life. Cut the rate on this grain and you stop the circulation of blood. The Interstate Commerce Commission performed the operation, effective January 1, 1922, when it forced a reduction in the rates on grain and grain products averaging approximately 17½ per cent, and a reduction of 10 per cent in the rates on all other farm products. The effect of this order was to wipe out approximately 6 per cent of the gross revenues of the Minneapolis & St. Louis and many other grain carriers.

July 1, 1922, the commission ordered a reduction of 10 per cent in the rates on all commodities not affected by the previous order. The effect of this was to take away an additional 6 per cent approximately of the gross revenues of these companies.

These two orders alone without any other causes would have been sufficient to force the M. & St. L. into receivership, but the situation was aggravated by the strike of the shopmen, and of the coal miners which, as may be recalled, took place in 1922. If the M. & St. L. had received the same rate of return per ton mile in 1922 and succeeding years that it earned in 1921 there would have been no receivership.

When the managers of the property saw where they were headed they resorted to every expedient to prevent a receivership. The result was a large amount of deferred maintenance. The outcome of this policy may be seen in the statistics for January, 1928, displaying an operating ratio of 97.2, figures which remind one of the times following the government's control.

During the receivership the officers of the M. & St. L. have made substantial expenditures for the purpose of bringing the property back to a normal condition with respect to maintenance, expenditures also for improvements and betterments, all of which involved some charge to operating expenses. Of course the expenditures have tended to make the operating ratio high, but with this is the satisfaction in the fact that the road is in normal condition at least as to ties, rails and ballast. Its locomotives are in first class condition, the per cent of unserviceable being only about 8 per cent, and the average condition of all power 68 per cent. The road has an abnormal number of bad order cars, however, according to the reports. If it scrapped all the cars now beyond repair of any kind the percentage of unserviceable cars would fall below 5 per cent.

The M. & St. L. has bought no new power since 1921, which means it needs it very urgently. It needs new freight equipment, particularly box and stock, and at present is asking the court to let it convert 300 bad order box cars, now not worth repairing, into stock cars; an excellent example of a road unable to make a better showing because it has old, worn out equipment.

In February the M. & St. L. had operating revenues about $50,000 higher than in the same month last year, while its operating expenses were about $25,000 less, giving the road an operating ratio of 82.26 per cent. The hire of equipment net payments, however, showed an increase of about $27,500, and the receiver's net income was about $53,000 higher than in February a year ago.

The Editorial of This Edition

WHEN a rate war began in the old days of railroading it started among the traffic departments. Nowdays it begins in the war department at Washington, is financed by the people—who know nothing about it—and is carried forward in the same way, with public money. In the open spaces, in the care-free times of the pioneers, this would have been called a cold deck and the men who

worked it would have been referred to in language not suitable to this kind of magazine.

The present war is a one-sided affair. You get the details of it in despatches from Washington announcing that beginning April 2, the war department authorizes a "fast" freight service, water and rail, between Chicago and the Twin Cities.

The war department says it will save 15 per cent on the all-rail rate charged by the railroads.

The war department can make any rates it wishes. The railroads can do nothing without the permission of the Interstate Commerce Commission to compete with this other branch of the government, and they have as much chance of getting this permission as Harry Sinclair has of rooming at the White House.

Major General T. Q. Ashburn, chairman of the Inland Waterways Corpn., says in his statement that freight will be shipped in a special package car over the Illinois Central railroad overnight from Chicago to Dubuque, where it will be carried by water to Minneapolis and St. Paul. It is expected that regular sailings will be made from St. Louis for St. Paul on Mondays and Thursdays. Barges will leave Dubuque for the Twin Cities Tuesdays and Saturdays, making the trip in three days. General Ashburn says:

"This offers a superior service on high class freight from St. Louis, Chicago and other eastern and southern points to the upper Mississippi Valley territory. Through bills of lading cover all shipments. The river rates are approximately 80 per cent of rail rates, and the rail and barge rate, Chicago to the Twin Cities via Dubuque, offers a saving of 15 per cent of the all-rail rate."

Did you ever expect to live to see the war department announcing cut rates and drumming up freight business in competition with the railroads? The Inland Waterways Corpn., is a branch of the war department. It has had the spending of a good many million dollars for barge operations on the Mississippi and Warrior Rivers, all in competition with railroads whose rates are government controlled, and it has spent this money exactly as all government money in such business undertakings is spent without helping any except a very small territory, too small to justify the cost. The entire story of the war department's operations through the Inland Waterways Corpn., has been one long history of costly failure—not because General Ashburn or his aides were incompetent or reckless; but merely because they have been trying to do something for which there was and is no demand large enough to warrant its continuance, something for which the people's money never should have been spent.

This Twin Cities service will fail. It may carry a few bulky commodities, but if they are too bulky they won't move. It will fail just as every other government entry into private business has failed. Why is this inevitable?

In a recent issue of the Annalist Prof. Arthur S. Dewing of the Harvard Business School, says government fails in business because governments "endeavor to function without recognizing the rule in industry of profit"; (2) the ultimate test of the value of governmental operation rests with its ability to meet competition in commodities delivered to the ultimate consumer for services rendered; (3) profits represent a negative cost in that without profits the ultimate cost of goods produced or services rendered is greater than with profits; (4) unlike private enterprises, the directing heads of government businesses carry on whether the enterprises are failures or success. Why? Because the people supply the means.

When the transcontinental roads proposed last fall to reduce the rates on canned goods from the Pacific Coast to the East their petition was denied by the Interstate Commerce Commission. One of the opponents of the proposed rate cut was the Mississippi-Warrior River Barge Line, the Inland Waterways Corpn. Practically every attempt the roads have made to meet the water competition of the Panama Canal has been defeated in the same way. The ship owners make their own rates. The government says what the railroads shall charge. The railroads have no relief. If this isn't a cold deck we know nothing about poker.

If you really crave to get the truth about inland waterway projects, free from all bias, government or railroad, spend a few days in Kansas City. Listen to the men and women who put up a million dollars, urged by the Kansas City Star, to navigate the Missouri River. Go to St. Paul and Minneapolis and hunt up more of the deluded ones. Try St. Louis and other river towns down to New Orleans. If you can then listen to a talk about inland waterway operation or read about it and not bark you will be entitled to a round trip vacation voyage on the Warrior River Barge Line somewhere in Alabama.

Sixty steam railroads have 1,253 buses in operation, covering 11,440 route-miles, while there are 19,099 buses operated in competition with railroads, the route mileage being 334,522. Electric railroads in 1927 were using 7,284 buses, compared with 5,150 the previous year. Common carrier bus route mileage increased from 232,340 in 1926 to 270,068 miles this year. The total number of buses in operation increased from 69,425 to 80,040 during the year.

Depew Is Dead At Ninety-Four

By

H. W. Walsh

A Recent Portrait of Mr. Depew in His Offices in the Grand Central Terminal, New York; President Crowley, New York Central Lines, at the Left.

CHAUNCEY M. Depew died early Thursday morning, April 5, of bronchial pneumonia. Had he lived until April 23 he would have been 94 years old. Mr. Depew caught cold while returning to New York from Florida. He was ill less than a week. As chairman of the board of directors of the New York Central and director or legal adviser of many other corporations he was in his office every day, and maintained up to the end his keen personal interest in every enterprise or duty with which his busy life was filled.

Almost everything constructive and historical in American railroads came into existence during the long career of Chauncey Depew. Other great executives have been well known but his name stood for far more than transportation. Better, perhaps, than any other in the whole record of railroads that name was familiar the world over. He was a lawyer; he served his country with outstanding brilliance in politics, state and federal; for twelve years he was in the United States senate; but these after all were not the things that gave him fame. That, as all reading America knows, was accorded him because of his great reputation as an after-dinner speaker, a wit of the first order, a man of big responsibilities, whose formula for happiness and long life was: Work, temperance and fun. Men whose business caused them to be included in much the same life led by Mr. Depew, great meetings, national conventions, banquets, luncheons; men who may be said to have heard most of

the stories worth hearing, have been known to declare they believed Chauncey Depew had originated about two-thirds of all the funniest and best. He made his first public speech several years before Abraham Lincoln became President. Nearly 70 years later, with health and vigor unimpaired, attending to his big job every day finding his chief recreation in public speaking, he was still a prime favorite everywhere.

Mr. Depew was born at Peekskill, N. Y., April 23, 1834. His ancestors on the paternal side were French Huguenots who came to America in the Seventeenth Century. On the maternal side he was descended from Roger Sherman, a signer of the Declaration of Independence. The house where he was born had been the Depew homestead for more than 200 years.

The father, in addition to being a merchant and farmer, also was a pioneer in river transportation between Peekskill and New York City. The mother, a woman of highly developed literary tastes, was chiefly responsible for the thoroughness of her son's education. He obtained his preliminary training in Peekskill Academy, and in 1852 entered Yale, from which he was graduated four years later as a barrister.

Returning to the farm at the age of 22, he clashed with his father over politics and subsequently abandoned the latter's Democratic faith to take local stumps in favor of Fremont and his Free Soil campaign. After the election he began practicing law, and earned his first fee—$1.75 for an opinion that required several days to prepare—just about the time Lincoln was first mentioned for the Presidency. He immediately entered the campaign on behalf of the latter and gained considerable fame as a political orator.

Eight years later he had been nominated and confirmed for the post of American Minister to Japan. Previous to this he had been secretary of New York state and had held several other public offices.

Just as Depew was preparing to leave for Japan, Commodore Vanderbilt acquired the New York & Harlem Railroad — 128 miles of "junk," as he afterward described it. He called upon Depew and offered him the position of general counsel at $7500 a year, but the young lawyer promptly informed the financier that he was to receive a much higher salary as Minister to Japan.

"It's up to you," Vanderbilt replied. "Railroads are the career for a young man. There is nothing in politics. Don't make a fool of yourself." Depew took the railroad job.

Beginning in 1866 as attorney for the New York & Harlem, he became vice president of all the Vanderbilt roads merged into the New York Central in 1882 and president of the New York Central in 1885. In 1899 he resigned to become chairman of the board of directors, a position he continued to fill through the eventful period of reconstruction following the World War.

Mr. Depew had know intimately every President from Lincoln to Harding. He became such a power in the Republican party that he was prominently mentioned for the Presidency, and in 1888, when the Republican national convention appeared to be hopelessly deadlocked, he received 99 votes for the nomination. It being apparent that a nomination was not possible under the existing conditions, as Mr. Depew concentrated the full strength of his state, he withdrew his name and threw his support to Benjamin Harrison, who was subsequently nominated and elected.

Mr. Depew declined several flattering appointments at the hands of President Harrison including that of secretary of state, and was not active in politics again until 1899, when he was elected United States senator from New York, serving until 1911.

Mr. Depew married twice. His first wife was Elize Hageman, whom he married in 1871, and by whom he had one son, Chauncey M. Depew, Jr. She died in 1893. His second wife was May Palmer, whom he married in 1901.

Bus Service Protects Railroads

Operation of motor buses by the Boston & Maine has protected that road against destructive highway competition, has developed new service to some communities and generally has helped to coordinate the best in rail and highway transport and speed schedules of through trains, the B. & M. reports in an answer to a questionnaire filed with the New Hampshire public service commission.

"The operation of motor buses," the road's report states, "will tend to delay and possibly prevent abandonment of rail lines in the future, provided the right is given to coordinate such bus and truck service with rail operations. If the railroad is not permitted to coordinate motor and rail service the opposite result will be reached. Independent bus and truck operators will, so far as possible, seize whatever profitable business there is, taking it away from the railroad, thereby increasing the railroad's losses on these lines to the point where continued operation of the lines cannot be justified."

Users of the highway must carry their proper part of the cost of that use, the road contends, and the operators of vehicles for hire should be placed under the same regulations as the railroads, with which they now compete without regulation and with virtual subsidies. Intrastate regulation of buses has advanced the solution of this phase of the problem. Similar regulation is greatly needed for common carrier interstate and intrastate truck operation and for interstate bus operation.

What the Government is Doing for Aviation

As Told to *U. V. Wilcox*

F. & A. Photos.

Smoke Screen to Hide the Navy Plane F-5-L During Air Maneuvers in San Diego Bay. An Official Photograph.

THE present national interest in commercial aviation gives special value to the articles offered in this issue describing governmental activities in this branch of transportation. These articles were written personally by Postmaster-General New, Herbert Hoover, secretary of commerce, Major General Mason M. Patrick, chief of the army air service, and Commander E. E. Wilson for the United States navy, and were prepared for this magazine exclusively by Uthai Vincent Wilcox, well-known Washington correspondent and special writer.

What has the government done, what is it doing to foster this new transportation? Is the machinery of the government leaning on commercial agencies in its use of aircraft? What may the people of the United States expect from their government for the future of aviation?

Several railroads—eight, to be exact—are arranging or contemplating airplane auxiliary service. Evidently the modern railroad executives do not propose to ignore the development of this new agency in transportation as some, in other days, ignored or opposed the adoption of automotive trucks and buses.

Two cabinet officers and two high ranking officers of the army and navy contribute the information contained here.

THE POSTOFFICE DEPARTMENT

By Harry S. New, Postmaster General

Now that the air mail service of the United States is an established institution, operating on regular schedules, day and night, during all sorts of weather conditions, over all kinds of country, and is carrying on without government subsidy or outside aid, it may not be considered unseemly to boast a little about the part the postoffice department has had in thus blazing the way for commercial aviation.

During the war when planes were being produced in this country faster than they could be shipped to the battle zone, the department began its experiments in expediting the mail by air, using surplus planes borrowed from the war department.

Experimental routes were opened and disbanded, others were established and extended, until within four years the postoffice department was operating with its own equipment a transcontinental service between New York and San Francisco with planes flying in daylight hours, and turning over their burdens to the railroads for continued transport at night.

Europe, too, gaining its lessons from the war, was extending aid in the form of governmental subsidies to any and all sorts of air ventures so that the continent was soon interlaced with air routes, carrying not only mail, but passengers and express as well.

Subsidies have never been popular in our own country. With this realization it has been the aim from the first, in encouraging commercial aviation, to permit it to stand upon its own feet.

To attain this end it was necessary to do considerable pioneering and research work, and with that aim the government sought diligently for ways to improve its new flying industry. The airplanes could beat the railroad train so long as daylight held out, but when darkness descended so did the plane and the railroad tortoise plowed on through the night overcoming the advantage in distance gained by the hare of the air.

Undaunted by this obstacle the postoffice department built across the plains section of the west from Chicago to Cheyenne a lighted airway one thousand miles long, and in August, 1923, gave night flying to the world, the greatest stride made by aviation since the Wright Brothers conquered the air.

With American commercial aviation still backward, the department continued its work of advancing the utility and practicability of its air mail service. New York and San Francisco were brought within 30 hours of each other by the regular through service, operating with unexpected efficiency night and day. Then an additional overnight service was established between New York and Chicago.

Early in 1926, when commercial promoters began showing signs of interest in the new industry, the department, under authority of congress, awarded contracts to private flying companies for carrying mail by air on lateral routes connecting with the government-operated transcontinental line, and, later additional routes having no such connection.

Since that time the transcontinental route has been turned over to private contractors, while the country is interlaced with 13 other routes, operating under contract with a daily mileage in excess of 20,000.

According to statistics from European countries which at first outstripped the United States in the progress of commercial aviation, the heavily subsidized lines are not doing so well as those of slower but sturdier growth in the United States.

Seven air mail routes operating from Bourget Field, Paris, carried a total of less than 800 pounds of mail during March, 1927, and less than 1300 pounds during April.

Aviation and the Department of Commerce

By Herbert Hoover
Secretary of Commerce

SYSTEMATIC commercial aviation in the United States has almost achieved, and within twelve months certainly will reach a point of development greater than that of all Europe put together. It has been developed upon a distinctly American plan, differing wholly from those of other countries and this plan, I believe, has now been demonstrated to have a sound basis.

Our plan has been that a sound transportation agency must be developed by private enterprise, without government subsidy; that the government support should be given only so far as we have for one hundred years given it to navigation.

This translated into aviation, means that the government declares the routes of national airways, builds their equipment of lights and emergency landing fields, furnishes charts, licenses and planes for safety and the aviators for competence, engages itself in scientific investigation and promotes and cooperates with private and local enterprise to do the rest.

All European governments have sought to produce these results by direct subsidies and in some cases by government operation. I know of no case where these governments have sought to produce these results by not contributing at least 50 per cent of operating costs. In some countries the subsidy runs as high as 90 per cent.

The opportunity for profitable enterprise is greater in the United States and there is perhaps a somewhat different attitude of mind in government as to the primary reason for development. The European aspect is largely that of supplement to military defense with transportation objectives secondary, while ours is primarily transportation with defense purposes secondary.

European development has been based first upon passenger carrying, whereas ours has hinged largely upon carriage of express and mail, a reflex of the different economic situation.

Per capita, we transport more than twice the goods, passengers and express transported by any European country and one-third more mail per capita than the liveliest of them, and we transport them over longer distances.

The exchange over the extreme areas from the Atlantic to the Pacific—3,000 miles—is greater than between any two European countries. We have, therefore, a much more favorable economic setting for development of this new form of transportation.

Be all this as it may, we have today 7,500 miles of improved national airways in regular operation, and the contracts let provide for 3,000 miles or more early in the year with still further extensions after that time.

We are rapidly developing well-equipped airports at every import-

ant town, and we now have 207 municipal ports, 163 commercial and private ports, not to mention 124 department of commerce landing fields.

Planes are flying regularly over 16,000 miles daily, and by the end of 1927 probably exceeded 23,000. About 2,000 commercial planes have been licensed and, judging by the advance orders with manufacturers, this number will be increased to 3,000 early in 1928.

The development of private enterprise has been largely the work of the last 18 months, since congress defined the basis upon which the air mail should be contracted for by private carriers, and enacted the law establishing the aviation division in the department of commerce under which designation the development of national airways and other functions are administered by Assistant Secretary MacCracken.

I believe we may say that our American plan has proved a success, and that we are well on our way to intensive development of commercial aviation. A great number of agencies have contributed to the creation of this plan and to the developments under it.

The great flights of Commander Byrd to the north pole and recently across the Atlantic, the magnificent performance of Colonel Lindbergh, the enterprise of Chamberlin and Levine, the flights of the army officers around the world, through South America and to Hawaii, have all helped to create confidence in the airplane and public interest in its development.

P. & A. Photos.

Colonel Lindbergh Had His First Real Vacation While in Panama, Fishing and Hunting. Here He Is Eating Cocoanut From the Shell.

The net result of it all is that we are entering upon a sound commercial development of a new and valuable transportation agency.

The United States Army Viewpoint

By Major General M. M. Patrick

Chief of the Air Service

THERE are two phases of aviation, military and civil. Yet they are interlinked and the army, therefore, takes a keen interest in the commercial advancement of aviation.

The motive power is the very heart of every moving machine. The small motor which the Wright Brothers first designed and built developed about 35 horsepower and weighed about five pounds per horsepower. Modern motors weighing less than two pounds per horsepower have been built already large enough to develop about 1,000 horsepower each. This motor development is still going on.

Taking up the use of aircraft for civil purposes, the transportation of mail, of express matter, and of passengers, we are reminded that man has never used a more

rapid method of transportation and then abandoned it. He has constantly improved it and made greater use of it.

Airplanes are the swiftest vehicles ever employed for transportation. It is as certain as anything can be that they will be more and more improved and more and more used, and that they will play an important part in our economic life. There are more planes in operation to-day in the United States than most persons realize. More has been done in the United States than in any other country in the world in promoting aviation. Department of commerce figures for all flying time for 1926 showed 36,000,000 miles. To cover this distance a train would have to travel constantly every hour of the day and night, going at 40 miles an hour for 100 years!

There are accidents occurring in aviation and they are regrettable. But even such accidents are constantly decreasing. Now, in military flying it can be accurately estimated just what this accident rate will be either according to the hours of flying or miles covered or both. Six years ago there was a fatality for every 1400 hours of flying. It is now five times as safe, for there is but one fatality for not less than 7,000 hours of flying. The army recently flew in training 31,000 hours with but one single fatality.

The postoffice department recently flew 2,292,263 miles with but one pilot fatality. One commercial company carrying mail has flown nearly 1,000,000 miles without a single serious accident. Passenger carrying has not as yet reached high figures in this country. In Europe, in 1925, English and German lines flew 4,500,000 miles with but one fatality carrying 75,000 passengers.

The ordinary passenger planes of the future will carry from five to twenty passengers and ordinary baggage. There will be one or two pilots with two or more motors capable of going from 100 to 125 miles an hour. There is now being built a plane capable of carrying 100 passengers. One design shows passenger compartments with sleeping accommodations, restaurant, baths, all in a flying wing 12 feet thick. The motors are capable of 4,000 horsepower, and with a speed of 100 miles an hour.

The manufacture of aircraft is increasing. The automobile output of this country is estimated at 10,000 cars a day. Already airplanes are being built in this country at an average of five machines a day.

Undoubtedly the next war will be decided in the air, and while every soldier who knows of war decries it the most we must perfect our air forces. A general advancement in aviation is helping in this. I believe that air mail will be shortly extended to include express. Air passenger service will follow. People and nations meeting thus more easily will come to better understand one another, and as Tennyson wrote 17 years before the first airplane flight:

> ". . . the war drums throb no longer and the battle flags are furled. In the Parliament of Man, the Federation of the World."

The airplane and aircraft will help to make this ideal possible.

The United States Navy

By Commander E. E. Wilson

Bureau of Aeronautics

THE LONG series of experimental flights begun by Commander R. E. Byrd and extending through those of Lindbergh, Chamberlin and Levine; Maitland and Hegenberger; Smith and Bronte, to Byrd's own trans-Atlantic adventure, marks the rise to supremacy of American aviation. These striking events are the culmination of years of effort on the part of numerous departments and individuals interested in aeronautical progress. The navy has contributed its share in the development of the air-cooled engine. The Wright Whirlwind engine used in all of these flights is the result of the program initiated by the navy department seven years ago and carried to final conclusion this year. The striking power plant efficiency and dependability demonstrated by these flights is the result of years of test and development in the great laboratory of the operating squadrons of our fleet. The navy department, by purchasing over 800 of these Whirlwind engines at such intervals as to permit the manufacturer to remain in continuous quantity production at an economical rate and by operating the engines all over the world, has contributed materially to the striking advance in the art of aeronautics.

The United States army air corps has fostered other developments which assisted in these flights and which are now in common use commercially. The army and navy development work then has certainly promoted aeronautics to a great degree.

One of the really striking aids rendered to commercial aviation has been the pioneer work of the postoffice department. Only those of us who are closely associated with aeronautics appreciate the magnitude of this work and the soundness of its inception. The postoffice department laid the groundwork for the contract air mail lines now being flown. These

This is the Calcutta, England's All-Metal Flying Boat, to Operate in the Regular Service Between India and Northern Africa, Over the Arabian Sea; A Passenger Liner. (U. & U. Photo.)

lines operated without subsidy are contributing materially to the advance of civilization.

As a result of the spectacular flights recorded, the year just closed marked the advent of great enthusiasm for aeronautics among the people of the country. The vivid proofs of the possibilities of aviation, demonstrated by these flights, has brought the financial backing and the interest and enthusiasm of many into the art. The United States may now be said to be air-minded, and this is the most hopeful thing that has happened to aviation in many years.

The last year marked the first test of the new scheme of administration with the appointment of three assistant secretaries for aviation in the army, navy and department of commerce. If results mean anything, it would appear that this system is an unqualified success.

Civil Air Accidents

Prior to the Air Commerce Act no agency was charged with the investigation or recording of civil air accidents and no reliable information is available upon which to base statistics. The department of commerce is required to "investigate, record, and make public the causes of accidents in civil air navigation in the United States." Following is a tabulation of civil accidents in aviation for the calendar year 1927. There is no civil aerostation save free ballooning for sport and there were no accidents reported during the year in this branch of aeronautics.

In the calendar year 1927 there occurred 200 reported accidents in which 164 persons lost their lives and 149 were injured, including both pilots and passengers. Airplanes to the number of 167 were complete "washouts"—damaged beyond practicability of repair. There occur to airplanes minor accidents similar to those occurring to automobiles but cognizance is not taken of these, of course. Of the 200 accidents, 34 occurred with licensed planes. Eleven licensed pilots and 22 passengers were killed in licensed planes. The balance were charged to unlicensed craft.

In scheduled flying over air routes there were six fatal accidents, six pilots and one passenger being killed. The balance of the fatalities were in the course of miscellaneous flying, including air service operations; and in experimentation, including contests, races, oceanic flights and such. The deaths in the "experimental" classification numbered 24 and are not properly chargeable to aeronautics as a means of public or private transport. The personal equation—error in pilotage—was the ascribed cause of 79, or 48 per cent, of the 164 fatalities.

To the end of the calendar year 1927 applications for pilot licenses were received from 4,145 persons. Applications for airplane licenses total 2,823 and for identification 908. The process of licensing is going forward as rapidly as possible but it will be some time before action on licenses and applications balance.

Air Transport Grows

Steadily the air mail makes its inroads. The report of the Pacific Air Transport, operating from Los Angeles to Seattle via San Francisco and Portland, shows this splendid record: Total poundage for five months ending December 31, 1926, 19,645; for first six months of 1927, 31,420; for last six months of 1927, 44,922.

Yes, Indeed, We Have Some Bananas, and They Are Hand'ed Exclusively Through This New Terminal of the United Fruit Co., at San Francisco.

New Banana Terminal

By C. W. Geiger

The United Fruit Co. has recently completed a new banana terminal on the Southern Pacific wharf in San Francisco for the transfer of bananas from steamers to refrigerator cars, which has resulted in making San Francisco the banana distribution center of the West. The new terminal, which is served by the Southern Pacific, has room for 47 refrigerator cars on its eight drill tracks, all under cover. Its office warehouse contains 10,000 square feet and there are 400 feet of wharf.

Thirty thousand bunches of bananas made up the first complete cargo of the fruit transferred recently from one of the United Fruit Co. steamers to 50 refrigerator cars spotted on the eight spur tracks. Heretofore bananas for the territory west of the Rockies and the Pacific Coast were unloaded at New Orleans. San Francisco was selected for the terminal site only after a careful survey of the entire Pacific Coast when it was decided that its location and facilities for distribution were ideal for this business.

"In the Midst of Life"

Four men were killed, February 13, when 20 cars of a 33-car freight train left the rails, knocked over Ballock station near Clairmont, N. H., and the wreckage of cars and station burst into flames.

Those killed were three section men and another man who were eating their lunch in the station.

The cars piled up against the railroad station which almost immediately burst into flames.

This Seems Reasonable

A vote of the passengers decided the service schedule of the night train on the Marburg-Frankenberg route in Germany.

After months of heated controversy between the federated railways and many of the local inhabitants, who, by word of mouth and in writing, had indignantly protested against "the untimely departure" of the last train out of Marburg, the federated railways hit upon the idea of putting the matter to a vote of the passengers on the train several minutes before it steamed out of the station.

Under the supervision of the train's personnel, the passengers were asked to answer with "yes" or "no" if the present schedule should continue. The "noes" had it. Thereupon the railway company agreed to alter the time table in conformity with the wishes of the majority of the commuters.

Why Not Fine the Copper?

"I find the defendant guilty," began Judge Lazarus in police court at San Francisco. The defendant leaped to his feet.

"Why, judge, you can't do that. I'm the city traffic engineer. I helped to make these laws."

"You wait until I get through," thundered the court. "I find you, George D. Burr, guilty of ignoring a traffic signal as charged and fine you $5. Now if you want to appeal, go ahead."

The steamship Aquitania burns 33,000 barrels of oil a day on its transatlantic voyages.

A Gas Electric Tractor Truck, and Trailer Loaded With Eight Tons of Broken Concrete. Manufactured by the Walter Motor Truck Co. of Long Island and the General Electric Co. for the Philadelphia Rural Transit Co.

Trucks Cut the Cost of Living

Helping Railroads Too

By A. J. Brosseau

President, Mack Trucks, Inc.

THE TRUCK, although you may not realize it, is a vital and important factor in our lives whether we be merchants, manufacturers, farmers, or consumers. We are all interested in lower transportation costs, which to the merchant means less expense, and to the consumer lower cost of living.

At this time of year we review the past and attempt to forecast future operations. You will be interested to know that for the third successive year the production of motor trucks has exceeded 450,000. The production for 1927 is estimated at 464,000, and truck registration as of January 1, 1928, is estimated at 3,000,000.

I mention these statistics at this time to emphasize the stability of the nation-wide demand for truck transportation.

I want to point out some definite facts as developed by government surveys which further indicate the increasing stability of truck use. It may astonish some of you to learn that the trucking business, serving the public as a mammoth agency for the collection and distribution of goods and operating over 3,000,000 miles of route, is actually controlled for the most part by individual owners. Estimates based on government statistics indicate that 3,000,000 trucks are owned by more than two million owners. Traffic surveys by the United States bureau of public roads further show that 83 per cent of all trucks in use are owned by farmers, merchants, and manufacturers, and operated by them as an incident of their regular business.

The intensive development of a great private or personal carrier transportation business is in marked contrast to the development of railroads and street railways into great common carrier systems. It is a development apparently contrary to all our American industrial experience. The trend in public utilities as well as private enterprise has been toward consolidation and the creation of great industrial machines, in order to reap the benefits of mass production.

In the first place, both the capabilities and the limitations of the motor truck as a transportation

An address before the members' council, New York Merchants' Association January 25.

unit tend to confine its use, as a matter of general practice, to a very limited field. It is not adapted for carrying a large volume of mass materials for any great distance. On the other hand, the economics of rail operation do not permit of the frequency of service for small units of freight which is possible with the truck. Neither can the train leave its tracks to deliver freight to the store door of the consignee.

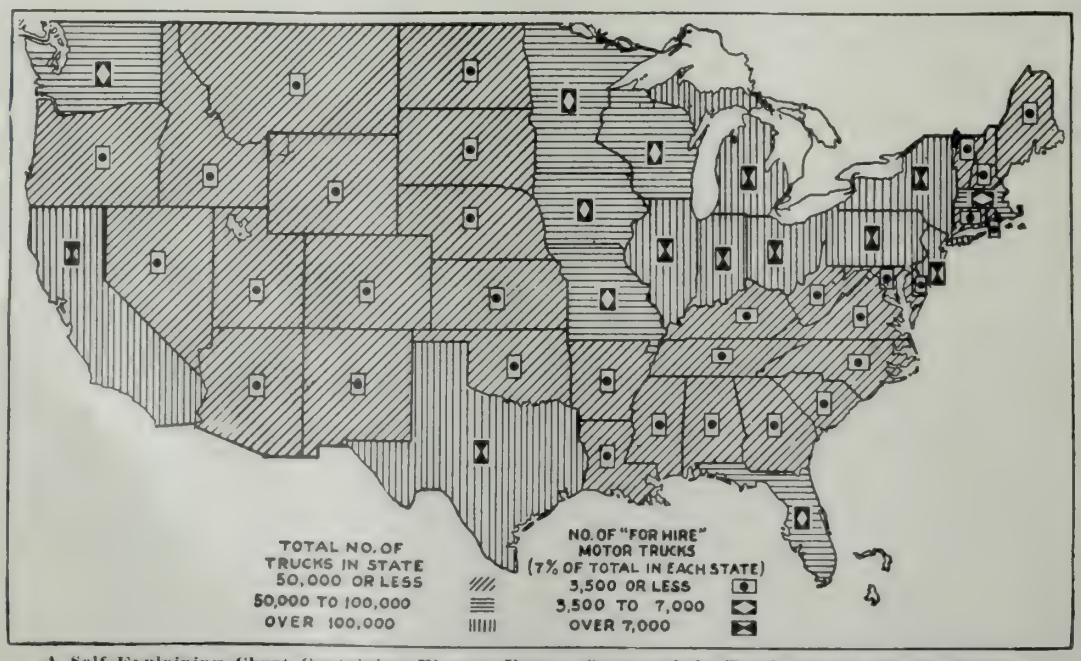
Under these circumstances the truck has developed as the foremost agency for the distribution and collection of freight in the short haul area. It provides a rapid, convenient and necessary service that I should like to designate as retail transportation. The rail carrier cannot render such service, its facilities being better adapted to what I call wholesale transportation.

In our metropolitan areas there is opportunity for consolidation among those in the trucking business, but I do not believe that throughout the country shippers will ever sacrifice the flexibility of the personally-owned small fleet truck service for large operation common carrier truck service. This is true because the cost of trucking is only one of the elements involved, and it is not as important as the character of the service that can be given by the p r i v a t e l y-owned truck, which adapts itself to the particular job promptly and efficiently.

Railroad men have always considered less than carload traffic as unprofitable and undesirable business. In taking over most of this business, the motor truck rendered a great service to the railroads. It relieved them of unprofitable and out-of-pocket business. In addition, it has eliminated congestion at the railroad stations and terminals. And I think there is no disputing the fact that by taking over short haul, less than carload traffic, the motor truck is responsible to a large extent for speeding up rail transportation generally. For example, during the first eight months of 1927, the average daily freight car movement was 30.9 miles per car. In the days of government operation the average daily movement was about 24 miles. At the end of September, 1927, at a time when in the past a car shortage was the usual thing, the railroads had 135,000 surplus cars, and were handling traffic with greater efficiency, and more profitably, than ever before.

This result has been brought about not only because shippers, whether merchants or others, were employing trucks, but because the railroads themselves were making use of them in short hauls and in terminal areas. Forty-six railroads are now using motor trucks in terminal service. Fifteen are using them to give store-door delivery, either directly or indirectly. And eleven are using trucks to replace local freight trains.

Numerous misconceptions regarding the use and function of motor trucks have been cleared away by the fact-finding studies made by the United States bureau of public roads in cooperation with the various state and local governments. Perhaps the most striking fact disclosed by these studies is that the truck is largely an owner-operated vehicle used to distribute commodities from rail heads or for short distances. In six different areas studied from 1922 to 1925 the government found that from 61 per cent to 81 per cent of all operations was for distances of less than 30 miles, while hauls of more than 100 miles made up a very small percentage—except in Cali-



A Self-Explaining Chart Containing Figures From a Survey of the Truck Situation by the National Automobile Chamber of Commerce. There Are About 2,775,000 Trucks in the Country.

fornia, where they reached 11 per cent, due to the long distance between towns inadequately served by railroads.

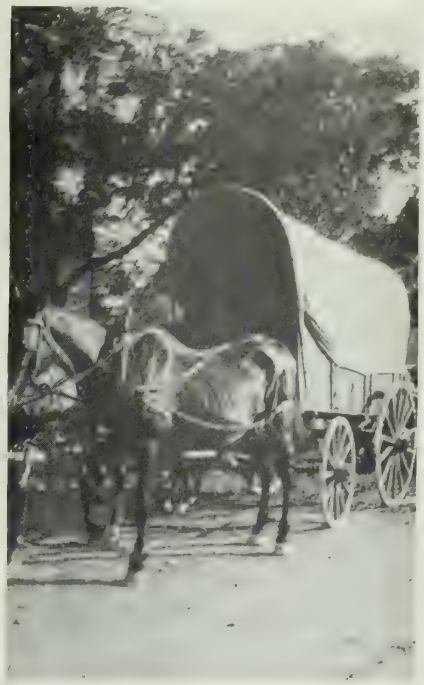
These analyses reveal that truck operations for the most part are conducted by merchants, manufacturers, and farmers who use this style vehicle instead of the horse and wagon of the good old days. Most of the remaining operations are conducted by so-called "contract haulers" who are not serving the public generally, but are using their facilities for serving a few patrons. These contract haulers represent 11 per cent of the total number of trucks in use. The number of trucks operated for hire in so-called common carrier operations is 7 per cent of the total trucks in use.

It is interesting to note that trucks engaged in interstate operations for hire represent only 1½ per cent of the total. As these facts become known and are better understood the agitation for regulation, designed to check and hamper the growth of highway transportation in the interest of rail carriers, is gradually growing weaker. There is evident today no public demand for truck regulation other than that designed to protect life, limb and property on the public highways.

You may also be interested in the motor bus. I am informed that bus registration has now reached an estimated total of 90,000 as compared with 80,000 one year ago. Of the total, 48,000 are common carriers and the remainder are school, industrial buses, etc.

The common carrier bus ownership is as follows: 8,500 street railways, 12,000 steam railroads, 35,000 independent operators—the pioneers in the field. Street railways and steam railroads are abandoning unprofitable rail passenger service and replacing it with bus lines at an ever increasing rate. Some 65 towns and cities under 50,000 population and several of slightly greater population, have abandoned trolley service entirely in favor of the bus. Improvements in the bus body and chassis are continually being made and are so revolutionary in some respects as to make it impossible to predict the extent to which the electric trolley car will be supplanted by the bus.

Buses with street car capacity—



This Was Snapped in Old Kentucky Not Very Long Ago. Not Many Such Rigs Nowadays.
F. J. Koch Photo.

seating 44 or more passengers, with ample space for 40 or 50 standees—are now available.

This vehicle which discharges and takes on passengers at the curb offers an opportunity to the trolley transportation companies to do their part to eliminate street congestion. If, as many of us believe, this type of bus (because of its flexibility) can make greater speed than a rail bound vehicle, it is not unreasonable to believe that its use will result in a larger return upon its investment than is possible with the trolley car.

In the light of these facts, I predict a rapid increase in the use of buses by electric railways in cities large and small, and an even greater development in the so-called interurban field, whether by rail or independent operators.

I believe this new arm of transportation is destined to a future that surpasses the most optimistic dreams of the ardent enthusiasts of a few years ago.

Truck Traffic Doesn't Hurt Railroads

A study of the situation made by C. E. Spens, vice president in charge of traffic of the Chicago, Burlington & Quincy, reveals that trucks now are used to haul live stock for a distance as great as 150 miles, although the average truck haul is only about 50 miles.

Use of trucks in Iowa is particularly widespread, as indicated by receipts of live stock at Sioux City stockyards during 1927. Of total receipts of 3,657,782 head of cattle, hogs and sheep, 31.9 per cent arrived by truck. Of 650,056 head of cattle, 158,444, or 24.3 per cent were shipped to Sioux City by truck, against 491,612 head shipped by rail. Of total receipts of 2,322,404 head of hogs, 922,405, or 39.7 per cent arrived by truck, and of total receipts of 526,878 head of sheep, 86,391, or 16.3 per cent arrived by truck.

At Omaha, of total receipts of 5,585,215 head of cattle, hogs and sheep, 1,210,449, or 21.6 per cent, arrived by truck. At Kansas City, receipts by truck were 9.1 per cent of the total of cattle, hogs and sheep, and at St. Joseph, receipts by truck were 19.6 per cent of total receipts. Percentage of live stock arriving at Chicago stock yards by truck is very small.

The greater proportion of truck transportation of live stock is done by trucking companies organized for that purpose, but many of the more important live stock producers operate their own trucks.

Rates for truck transportation in most instances are higher than corresponding railroad rates in carload lots, but compare favorably with railroad rates for less than carload shipments.

Real success is won only by hard, honest and persistent toil.—Charles M. Schwab.

Steamship Dixie of the Southern Pacific Lines (Morgan Lines) Which Left New York Recently on Its First Voyage to New Orelans.

About the New Dixie

The Dixie, latest addition to the Southern Pacific Steamship lines equipment, shown in the illustration, was built at the Kearny, N. J., yards of the Federal Shipbuilding & Dry Dock Company at an approximate cost of $2,400,000. The Dixie was designed by A. S. Hebble, superintending engineer of the Southern Pacific Steamship lines who had immediate charge of construction under the direction of Lewis J. Spence, executive officer of the Southern Pacific Co., who personally supervised the arrangement, decoration and furnishing of the vessel. The Dixie is to be operated between New York and New Orleans. She made her first trip in January with Captain Charles P. Maxson in command.

The length of the steamer is 445 feet overall; molded beam 60 feet; displacement 12,160 tons; loaded draft 25 feet 6 inches; gross tonnage 8,100 tons; net tonnage 5,000 tons; deadweight capacity about 6,900 tons; cubic freight capacity about 420,000 cubic feet; and accommodations are provided for 379 passengers. It is an oil-burning vessel of longitudinal (Isherwood) construction, driven by De Laval steam turbines, and is capable of a speed of 16 knots an hour. In construction and equipment a standard well above the average of operating efficiency and economy has been achieved, and the safeguards of passengers and crew, such as wireless, lifeboat equipment, and prevention, detection and control of fire by steel decks, steel fire screen bulkheads, and steel doors in passageways, fireproof partitions, ceilings and panelings, automatic fire detector system, Lux fire extinguishing system and manual alarm system, are unsurpassed. Accommodations have been provided for 279 first cabin and 100 third class passengers.

For Trans-Atlantic Dirigibles

The American government will encourage the efforts of British interests to establish a trans-Atlantic air mail service by use of dirigibles, according to Secretary Hoover. If test flights of the balloons in England are successful, part of the capital to finance the enterprise will be raised in the United States.

Mr. Hoover said the navy had granted permission for British air lines to use the mooring masts at Lakehurst. The postoffice department is studying the possibility of legislation permitting special rates for air mail across the Atlantic. Mr. Hoover said the proposition had great possibilities for the commerce of both the United States and Great Britain.

Speaking of railroad bridges, the Germans are building one from Stralsund, over an arm of the Baltic that will be more than two miles long and 105 feet above the water. Even an American contractor will admit that this is a real job.

Nobody knows more than we do that all our boasted mechanical efficiency and skill would be as nothing without the spiritual efficiency of contented minds.—Frank I. Fletcher.

Little Stories About Big Men

Arthur L. Humphrey, President, Westinghouse Air Brake Co.

SUPPOSE you are dispatching trains, and some night about thirty minutes after you've checked up the transfer so that you know just where most of your trains are at, as they say in Texas, the wind begins to howl and the sand piles up all over the division if you're in Arizona or snow if you're in Michigan, and the first thing you know a stock train, forty cars of oranges, and a silk special are off the track or half buried, and right in the midst of the row you get word that the president of the road wants his car put on Number 8 which is due to leave in less than an hour? What do you do? Of course you might tell the president to take a quick running jump for himself, but you won't because such language would be in distinctly bad taste unless you intend to take a long lay-off.

Or just suppose, to make it a bit easier, you are the vice president and general manager of a company making airbrakes and no one in the plant has the remotest idea how to make anything else. A great war has been taking your best men for targets; everything seems headed for the downgrade to wherever it is that some folk fear they'll go eventually, and right in the thick of it along comes a demand from your beloved government for shells, millions and millions of them, and the only shell you've ever seen was used in your trusty old shot-gun. What would you do?

So would most men. You probably would blow up, if you understand the railroad meaning of the expression. But this is your big moment. If you're not equal to the emergency you're down and out, positively. In the case of the train dispatching, which certainly is a job made up of crises, demands for quick and accurate thinking, obviously the first thing to do is call the superintendent—but be careful what you call him—rout out the trainmaster and a few relief crews, and don't try to carry the whole load yourself. This is common-sense advice, worth a great deal of money, and you get it here for practically nothing.

As to the order for shells, the real reason for this literary gem, what did Arthur Humphrey do when it came to him one day in 1915? He did just what any other level-headed captain of industry would do, provided he had

the Humphrey brand of gray matter between his ears—we're not strong on anatomy, but you know what we mean—he called for help from the men he knew he could trust.

"No man ever made a fine record in anything entirely through his own efforts," said Mr. Humphrey, talking to a writing chap, one day in New York. "Show me a man in a responsible position, and I'll show you a man who has had help—who has known how to master help in a pinch—who has learned the knack of sharing the load. I'm sixty-six years old. For forty-five of those years I haven't put my finger to a piece of work that the other fellow could do just as well for me. My work has consisted solely of doing what the other fellow could not do for me. If I've got anywhere in life, it has been on that basis."

It takes a man who is big, mentally, to make that kind of admission. The type is not common. Really successful men have much self-confidence, which some persons misinterpret as conceit—and it is not—but this never leads them to imagine they can run the whole works alone. They know better. They are good leaders, these captains, but they must have something to lead, and usually they select competent men who know how to take orders and how to execute them properly. The conceited man, calling himself "self-made," is apt to believe that if he were suddenly jerked skyward from the earth the spot upon which he had been standing would be set aside by the government as a national park. The genuine, brainy success in the industrial world knows that self-made men owe their affluence, their high positions, to loyal employes and friends, to their ability to make men believe in them, and finally to a constitutional preparedness for emergencies. This preparedness is chiefly the product of experience, training, environment, and somewhat less, perhaps, to heredity. Big men know that responsibilities are as necessary as possessions if they are to be happy, and they share these responsibilities with their men. You never can build up a fine organization giving men orders but keeping the responsibility yourself. Share

Arthur Humphrey and His Grandchildren.

it, and you spread the happiness. Don't try to open all the mail.

Arthur Humphrey didn't have a solitary machine in the plant for shellmaking when the government stepped in one day with its big order, and making shells is a very ticklish job no matter how fine your equipment. It isn't necessary here to describe the process because we aren't going to make any; everyone knows by this time that the business calls for scientific precision, absolute accuracy, great care, particularly in the making of fuses, processes so nice, using the word in its proper sense, that the opening of a door or window while the powder is being handled would be disastrous.

The Westinghouse people weren't hankering for shell orders. They knew they would have to spend several million dollars getting ready before they could turn out a shell. But if they didn't hop into the new business it looked as if they would hop into a prolonged depression so far as the airbrake trade was concerned, and thousands of men would be out of work. By and large, as Sam Blythe would say, it was a great moment. It called for a decision. There sat Humphrey, thinking—thinking. There stood his helpers, his loyal staff, his friends of the airbrake business. "What," they inquired, "what are we going to do?"

"We'll fill the order," said Humphrey.

In ten weeks shells to bump off many a Heinie were being turned out by the thousand. The order was finished, nearly 10,000,000 pieces, and so far as this story cares the money was safely stowed away in the Westinghouse coffers or something, and the contract was checked off the books. While we are at it, this is a good place to say that the shells were all accepted, perfect, and throughout the whole period only one workman was injured. It is perfectly proper, too, to say that shortly afterward Arthur Humphrey became president of the airbrake company.

Men fail in great crises, Humphrey says, because they clutter their brains with a lot of details properly belonging to others. No general ever won a battle, he reflects, without his staff and army, a philosophical discovery to which we have referred once or twice in these chronicles. The executive with a littered up desk, covered with junk, scenery intended to impress visitors, really isn't an executive at all. He's just a grandstander.

In many ways Arthur Humphrey's life story is a carbon copy of many another big man, farm ancestry, old New England stock, but western rearing. He was born in 1860 near Buffalo, N. Y., whither the original branch of the

family had moved from Massachusetts a hundred years previously. He was only six months old when his father decided to move to Jackson county, Iowa, and there being nothing to do about it Arthur went along. At eight years he was motherless. The family, as often happens, began to scatter, marry, establish new homes. The old, old story. Nothing more tragic in life than this breaking up of a large family, the forking of the highways, travelers mounting the hill to gaze at new horizons.

The first big moment for Arthur Humphrey came at 14. He had to do something. The western atmosphere was working in the growing boy. He had to do something for himself, the first demonstration of self-reliance, determination; old as history itself but always interesting. There was a married sister at Plattsmouth, Neb., and to that place the boy journeyed by himself, his heart full of hope, his only possessions the clothing he wore.

In and around Plattsmouth young Humphrey did all kinds of work, and in between the jobs went to school. Farm work, harvesting, any job he could get he took, just as many another sturdy youngster has done, to earn money so that during the fall and winter he might go to school. Among other things it is related of Humphrey that while acting as foreman or something in a drug store he displayed so much mechanical ability in fixing up an old, broken-down generator for a soda fountain that he attracted the attention of a customer, one Doctor Livingston, who encouraged him to study machinery. This old doctor, Humphrey declares, took his father's place. Being the local surgeon for the Burlington, the doctor was able to get the boy started. Doubtless it was he who spoke to the master mechanic who called one day and offered Humphrey a chance as an apprentice. He started at fifty cents a day. That wasn't much money. Not enough to cut much of a splurge. To break anywhere near even the boy used to meet a train at 1:30 a.m. and carry the baggage of the travelers to a little hotel in return for which he had a place to sleep. He worked this split trick for eight months.

The years passed in orderly procession according to the calendar, and Humphrey went up to a dollar and a half a day; he became a machinist, he could handle an engine. He moved to Omaha, got three dollars a day which was very astonishing to him, and in 1880 was sent to Rawlings, Wyo., when that thriving railroad town was no bed of roses. It was a rough burg, but there he learned to handle men when handling men was one big man's job.

Mr. Humphrey Seems to Have Been Ready for This Moment When It Came Along.

After a while he drifted westward to Sacramento, then to Seattle where he and two others opened a machine shop and foundry, sold out and returned to California, and worked for the Southern Pacific. Then, glory be, he went to the Needles. There he stayed for three years and left to become superintendent of motive power for the Colorado Midland, another test of manhood. He made good on the Midland, pulled the road through the Debs strike in 1894, and made a record in the big snow storms of January, 1898, a record accomplished against the worst kind of odds.

Finally Humphrey became superintendent of motive power on the Alton. Through the years he had kept on studying, planning, devising ways and means, forming constructive views on safety, cutting the costs of transportation, learning to write and speak for the public; in short acquiring the qualities essential for the man he turned out to be. The importance of all this is shown in the fact that while he knew nothing about it some pretty big guys were watching him and his work. In 1903 the Westinghouse people made him their Chicago manager. In this post he acquired the things needed for the place already decided upon, doubtless, which eventually he filled. In 1910 he became vice president of the Westinghouse Air Brake Co., and finally sat in the presidency where he is today.

What has been this man's chief qualification? His determination to be ready; his faculty for friendship-making; his ability to get men to work for him and his company, to make them like their jobs. Talking one day to William S. Dutton of the American Magazine about these things Mr. Humphrey said:

"There's no secret about making friends nor in getting men to push for you. Simply ask yourself, 'What kind of person would I like my boss to be?' Keep within that answer, and you'll be what your associates want you to be. Turn it around, and you'll be what your boss would want you to be."

Mr. Humphrey is president or director of so many companies that the list looks like a city directory,

and his clubs take up the rest of the space. At San Bernardino, Cal. in January, 1890, he married Miss Jennie Field, and they have two sons, Arthur and Frederick. This is the point at which most such yarns terminate, but this one would be incomplete if something were not said about Mr. Humphrey's distinctly human attributes, or at least one of them. He does like hunting and other outdoor sports. And if you doubt this, or think it just one of the narrator's deft touches for human interest effect, look at the turkey picture. If you seek the domestic side, look at the man with his grandchildren. But grandchildren, as all wise men and women know, are much finer and smarter than your own.

Well, Which?

In Wall Street a story is told of a former railroad president, noted for the big things he accomplished, who was ever a stickler for facts. When he asked his employes for information he expected that it would be definite.

Enroute through the cheerless deserts of Nevada one day a train carrying the president and several other officials of the road passed a little station with much platform, a bleak background of sage brush and junipers, and no habitation within sight.

"What does that station serve?" the president asked one of the officials with the party.

"It ships a few cattle and two or three cars of wool."

"Which is it, two or three?" asked the big man. "There is a difference of 33 1/3 per cent."—E. T., in Business.

Memory or System

Edward Harriman was credited with having a wonderful memory whereas it was simply a demonstration of systematizing things.

"When you jump from one thing to another," Mr. Harriman was once asked, "do you have to stop and think and adjust yourself to the new mental condition created by the consideration of a totally different subject?"

"No," he answered.

"You are not conscious of any change in the speed of the mental machinery, as it were? No break of any kind when you decide what to do in this case and immediately what to do in the next—jumping from a matter in New York City to some engineering problem in Utah or California?"

"No."

"How do you do it?"

"I don't know. I think," he went on meditatively, "that the mind is like these—what d'ye call 'em on this desk?—these pigeonholes. A man comes to me! I listen and decide on what to do; and then it goes into a pigeonhole."

"And it's always there?" No trouble in finding it again at any time?"

"It's always there."

He was thinking, obviously seeking an explanation. "It's always there. Whenever I need it again I find it there."

"And you don't know how you do it"?

"I don't know how I do it," he repeated, almost hypnotically. Evidently he was trying to find out. But after a moment he shook his head and said: "But there are fewer pigeonholes, I think."

To Mr. Harriman, an earth embankment was not an earth embankment but a straight track between two stations. This straight track between two stations was no isolated detail, but a part of the Union Pacific Railroad. And this in turn was but a link in that worldwide transportation system which was his goal. Spikes, rails, and ties he bound into construction units; construction units in turn he bound into railway units; and these finally he thought of as parts of a vast system, an orderly yet progressive sequence in thought.

Another thing that helped Mr. Harriman: He never tried to remember the unimportant, non-essential things of life. Many persons go around with their minds cluttered up with a lot of useless, trivial facts. When you see one of these lists of test questions in a magazine or newspaper avoid it as you would a dangerous germ unless the questions apply to the business which takes so much of your brain power. If you are engaged in the railroad business you need not worry because you can not remember the name of the capital of Estonia, or how far the Big Dipper is from the moon. But of course, like everything, this indifference must not be overdone. There are some things outside your daily business which, as you value your life, you would better train yourself to remember. Lamb chops and thread and the Thursday magazine may mean little in your railroad life but you'd better keep a pigeonhole for such things. Your wife may tell you to fetch them home some night.

The Picture on the Cover

If you have ever visited New Orleans as a railroad traveler you have crossed Lake Ponchartrain on the great trestle or bridge shown in the picture on the cover of this issue. That part of Louisiana, as most folk know, is a region of extremely heavy rainfall—60 inches or more a year. This is rather hard on ordinary wooden structures. But here is one built of Southern pine which has withstood for many years not only the rainfall but also the waters of the lake. Must be pretty good wood.

San Diego citizens have voted by about four to one to spend $650,000 to build an airport on the tidelands. The airport is to be called Lindbergh Field, to mark the fact that Col. Lindbergh started from San Diego in his San Diego-built plane to reach New York for his hop-off in the flight he made to Paris.

Training for Railway Work in Africa

U & U Photo

London of Today. Holborn at Kingsway, Looking Northeast. Several Kinds of Transportation in This Crowded Street.

A Comprehensive Program

By Sir William W. Hoy, K. C. B.

Gen. Mgr. South African Railways, Johannesburg, Union of South Africa.

INSOFAR as general educational training is concerned, this is provided in the larger towns of the union at continuation classes conducted by the union department of education, which are open to all those desirous of availing themselves of the facilities offered.

At the large railway centers in the union training classes are from time to time conducted by experienced officers of the railway and harbor administration, which the members of the staff are encouraged to attend and are afforded facilities for doing so. This training covers generally the various phases of railway operating, station and goods accounting, shorthand, telegraphy, etc. The progress of those attending the classes is carefully charted and periodically reported to system and divisional officers.

The technical training of apprentices in the artisan grades is provided at technical colleges established by and under the control of the union department of education, or by technical institutes and colleges under other control and grants are given by the railway and harbor administration, where found necessary.

The Apprenticeship Act requires an employer in a designated trade to teach the trade to his apprentice, and to make suitable arrangements for his attendance at an approved educational course, the employer being liable for the payment of reasonable class fees if the apprentice attends regularly and shows satisfactory progress.

The courses provided at the technical colleges are intended to be parallel to those in the workshop, their function being to secure for the apprentice that comprehensive grasp and full understanding of all the dealings of his craft which the workshop, as at present organized, may not always be able to supply.

Insofar as higher education is concerned, this is always obtainable at the universities and colleges of the union on payment of fees, students being able to proceed to

Wide World Photo

Similar to Our Own Instruction Cars, Are Two Coaches Equipped by the London & North Eastern Ry., for Enginemen and Students. These Cars Contain Complete Westinghouse Airbrake Parts.

the graduate stage. In addition, certain of the colleges, such as the Transvaal University College at Pretoria, make a regular practice of conducting correspondence courses on selected subjects, special provision being made to meet the needs of public servants in this respect.

There also exist at most of the railway depots throughout the country, institutes provided by and maintained partly at the cost of the administration. Facilities provided at these institutes include circulating libraries, reading and recreation rooms. Classes on suitable subjects are from time to time organized and conducted by the committees of these institutes. In the absence of instructors attached to the educational department or a technical college these classes are carried on by members of the staff, and have been found to be of considerable advantage to the junior members.

A new field of training for railway men in the union is now being offered in the formation of a South African branch of the Institute of Transport, London. A descriptive article was published in the March, 1926, issue of the South African Railways and Harbours Magazine, showing what has been accomplished in South Africa in connection with that movement. From that article the following is extracted:

"The work involved in preparing a pioneer examination scheme has necessarily been long and arduous. The syllabus has, however, been completed and covers the graduateship examination and the associate membership sections, namely, traffic, engineering, audit and legal.

"The institution of examinations calls for adequate tutorial facilities, and the institute has been successful in inducing certain of the universities in the British Isles and a number of other educational bodies there to provide new or expand existing courses of study in transport subjects. In addition, it has obtained promises of the extension of such courses as circumstances permit and demands warrant.

"The insistent requests for the holding of examinations abroad has really been the chief factor in stimulating the growth of a South African branch, and as the proposal to form such a branch becomes known to the educational authorities in this country, it is hoped that it will not be long before the universities and technical institutes of South Africa will provide all the necessary facilities for the technical training of men in transport methods."

A. W. Green, statistician, contributes interesting and valuable facts from a manuscript prepared by a staff officer showing educational facilities offered by the Metropolitan District Railway Co., of London, the London Electric Railway Co., the City and South London Railway Co., and the Central London Railway Co. From these data the compiler sets down this program:

Administrative staff; clerical and technical. These companies make an annual donation to the London School of Economics and Political Science, by virtue of which they are able to nominate a number of students, approximately 80, every year for free attendance at the lectures held during the three terms, Michaelmas, Lent and summer. The lectures include such subjects as—

The law of carriage by railway
Commercial railway economics
General statistics
Accounts of traders and companies
Cost accounting
General economics of transport
Business organization.

Students are encouraged to attend regularly and to sit for the examination held at the end of the courses. Details of their progress are noted on their records. Awards are given to members of the staff who pass the international and fin-

International Newsreel

Railroad Yards and Terminal Facilities at Algiers. Except for the Quaint Looking Goat the Scene Isn't So Very Different From One at Home.

al examinations of the Chartered Institute of Secretaries and similar bodies. The fees of members of the staff admitted as students or graduates of the Institute of Transport are paid by the companies for three years in each grade. Members of the junior staff who attend evening continuation schools have their fees refunded by the companies subject to their obtaining satisfactory reports as to attendance and results.

Staff meetings are held, from time to time, at which papers on operating, engineering and other subjects having relation to the companies' operations are read and discussed by members of the staff. These meetings are open to members of the supervisory staff.

As far as possible the junior clerical staff is recruited from the ranks of the lads who have obtained either the matriculation certificate or the general school examination certificate of the London University, or have passed an examination of equivalent educational standard. Before entering the senior class at age 18 they have to give proof that they can satisfy the requirements of the department in which they are to be employed.

With the object of training men suitable to fill the higher administrative posts as vacancies occur, a scheme of cadetships has been established. The cadets, of whom there is a strictly limited number, are appointed partly from existing staff and partly from suitable outside candidates. They are required to obtain experience in several departments or sections of departments, and to qualify in not less than three separate sections during the course of their training, which normally is bridged over three years. Reports are made periodically by the cadets themselves upon the work undertaken, and also by the officers under whom they are engaged from time to time.

Supervisory and wages staff; railway, operating. A training school is maintained which deals with the engagement and training of new staff (operating department), and the education of staff with a view to promotion.

During the winter months classes are held for instruction dealing with both the theoretical and practical side of the duties of all grades. These classes are quite voluntary and open to all members of the operating staff, the object being to give every assistance to the men to become proficient in the grades to which they may have been promoted. The session is divided into two terms, an examination being held at the end of each term, i. e. December and March, and certificates issued to successful candidates.

Candidates for promotion to higher grades are reexamined and if fit are required to pass the standard examination in theoretical and

Herbert Photo

One of Forty Bus Coaches, As They Are Called Over There, Just Put Into Service by the London & North Eastern Ry.

practical knowledge of the duties of the grade concerned; in the case of certain grades such as guards and motormen, actual training on the line by competent instructors is given prior to taking the examination.

Railway, engineering. The scheme of apprenticeship relates mainly to sons of employes. They are not indentured, but the father or other guardian is made acquainted with the conditions of apprenticeship. Boys are appointed after a month's probation, at the age of 16, and continue until they reach 21 years of age. Their work and conduct are carefully watched while passing through the various sections of the department in which they are employed. They are encouraged to attend night classes, and periodical reports are made with respect to their progress, conduct, etc. On completion of the term they are given a written certificate regarding their ability, timekeeping, conduct, etc.

For the junior staff, including apprentices engaged in the department of the signal engineer, a fully equipped signal school is provided at which instruction is given. During the winter session a course of technical lectures is given, open to the whole of the staff of the repartment. The apparatus at the school of instruction is also at their service, and advice is given by a competent official on any question which may be raised by the staff in connection with their duties. Full advantage is taken by the employes of the facilities offered them to become more fully acquainted with the signalling installations.

The staff officer is responsible for the supervision of education and training of administrative staff, while in the case of supervisory and wages grades this matter is in the hands of the heads of the respective departments.

A Thrill for Railroad Police

A movie thriller was enacted by Canadian Pacific Railway police of Montreal, one day last month, when they pursued and captured a quartet of young men who had stolen a motor-driven work car with the intention of going to Ottawa. The chase was made in a locomotive.

The "desperadoes" decided to seek their fortunes on farms in the district of Ottawa. Having no money, they obtained a small motor-driven work car and stepped on the gas. They disregarded all signals and semaphores.

As the car passed South Junction, some distance from Montreal, a horrified telegraph operator, aware that the boys soon would run into an oncoming train, notified headquarters. A locomotive was requisitioned immediately from Outremont yards and with this four police officers chased the youngsters until they were captured. The motor rail car was taken off the track just in time to avoid a freight train.

New Guide for Airplanes

The latest aid to air navigation, a radio device to allow the pilot of an airplane to see whether he is on his course, was demonstrated, one day last month, by the bureau of standards and William P. MacCracken, assistant secretary of commerce for aeronautics.

A plane equipped with the mechanism was successfully flown at College Park, Md., near Washington and the new device probably will be in the air service regularly in the future.

While radio guidance for airplanes has been previously developed, the device tested is completely encompassed in a dial on the instrument board of the flying machine. A pilot instead of listening constantly through headphones for radio signals will merely watch a pointer, and by keeping it at a predetermined point, will know that he is on his proper course.

Signals from a radio beacon anywhere within 100 miles of the moving plane will serve to guide the instrument.

A great nation is made only by worthy citizens.—C. D. Warner.

"Happiness at work comes from working, not shirking."

Truth is stranger than fiction, judging by some of the dumb stunts revealed by accident reports.

People of Brazil bought 3920 more American automobiles and trucks last year than the previous twelve months.

A Little Maintenance Work to Do

Congressional Fences Shaky

By W. E. Hopkins

Washington

FROM a mass of investigations, hearings and debates, congress has now entered the final lap for the present session which is expected to terminate the latter part of May. What the final outcome will be can not very well be foretold but it is safe to predict little legislation of interest to transportation will come from the present session.

Being "the" political year when both parties must make hay while the congressional sun shines in anticipation of the fall presidential election neither side of the chamber seems eager to write any more legislation on the books than is absolutely necessary.

The house interstate and foreign commerce committee has agreed on the Parker Railroad Consolidation bill which it is believed eventually will be passed by the house without serious difficulty. The senate interstate commerce committee of which Senator Watson of Indiana is chairman will shortly take up consideration of the matter, its deliberations being based on the house bill as reported but there is no assurance that the senate will agree to any railroad consolidation bill at this session even should the committee reach an agreement on any such legislation.

The senate committee has been enmeshed for weeks in hearings on the bituminous coal situation, and senate leaders doubt whether these hearings will be completed by the time adjournment is taken. Few hearings have taken place at the capitol in which as much bitterness has been shown as in the present bituminous coal investigation, and if possible this bitterness has been intensified by the testimony now being offered. In view of this fact, it is becoming apparent that the chances for working out a solution of the coal question are becoming daily more remote. In any event, it is considered by responsible senate leaders that the enactment of legislation at the present session designed to bring about a solution of the problem will be impossible before both houses adjourn.

In the course of the hearings, Senator Gooding, Republican of Idaho, has called attention repeatedly of both miners and operators as well as other witnesses, to the Railway Labor Act which provides for mediation of labor disputes among railroad employes, and the question is asked whether those witnesses would agree to similar legislation for the coal industry. Frequent inquiries have been made also as to whether the coal interests would agree to the establishing of a federal commission similar to the Interstate Commerce Commission to regulate the coal industry.

A surprise was sprung recently by Senator Gooding of Idaho in having his long and short haul bill favorably reported by the senate interstate commerce committee. The bill is similar to those considered by the committee in previous years. While it is altogether possible that the senate may pass the measure, it is considered very unlikely in view of the previous action of the house committee in rejecting it.

Rejection by the senate of the nomination of John J. Esch to be a member of the Interstate Commerce Commission was in accordance with general expectation in Washington. The senate's action is quite widely expected to have an adverse effect on the morale of federal commissions, and establishes a precedent whereby any section of the country, disgruntled over some decision of a federal commission, can go to congress and seek redress when the time comes to re-appoint some member of that commission.

A bill for the regulation of motor vehicles engaged in interstate commerce as common carriers on the public highways, has just been introduced by Congressman Parker of New York, chairman of the house interstate and foreign commerce committee. The bill is sponsored by the bus division of the American Automobile Association and early consideration of the bill by the committee is expected. Before final action on the bill is taken however, extensive hearings are planned.

The Interstate Commerce Commission has fixed the tentative valuation of the Western Union Telegraph Co. within the United States at $84,995,384 as of June, 1919. The company's capitalization on that date was $129,792,726 and its book investment $155,459,119. The valuation as fixed by the commission does not include the company's cable system situated outside the United States over which the commission has no jurisdiction. The company, according to the report, had 182,536 miles of main telegraph lines within continental United States on the date upon which the valuation was fixed by the commission.

The West Leads in Air

The West leads the East in applied airmindedness, if the air mail carried on the various routes may be taken as an indication. In the calendar year 1927 the Los Angeles-Salt Lake City route led all others in the use of air mail. Taking the population of the trading areas along this route, each 1,000 people produced or received 119.4 pounds of air mail during the year.

The second highest is the Pueblo-Cheyenne route which handled 33.1 pounds for the 1,000 population unit. The San Francisco-Chicago route was third with a volume of 32.1 pounds on the same basis, followed by the Dallas-Chicago route, 30.3; and Chicago-New York with 30.1.

The Salt Lake City-Pasco route, including the Seattle-Tacoma-Spokane region, was sixth on the list with 29.8. Los Angeles-Seattle followed with 14.7.

For the first six months of 1927 the Transcontinental, including the Chicago-New York overnight service, carried 14.7 pounds per unit of population. In the second six months the western half carried 32.1 pounds per unit and the eastern section 22.4 pounds, or an average for a year of 27.2 pounds for both sections, making no allowance for poundage weighed twice.

An Inspector that Inspects

Engineers, roadmasters, section foremen, railroad officials generally, have talked about the mystery of broken rails for many years. Volumes have been written on the subject. The great convention in London in 1925 of the International Railway Congress devoted thousands of words to discussions about transverse fissures. The only things about which everyone seems agreed is that rails do break and cause wrecks, and that these breaks have not been due to neglect. Looked at from the top or side the rails seemed to be all right. Robert W. Sands, a western roadmaster, believed the inspection was faulty; not that anyone was careless or incompetent, but merely because no ordinary inspection would disclose the faults.

So Roadmaster Sands devised an extraordinary inspector, one that could see things he really ought to see. The result of his pondering is shown in the illustration. Indeed some of the conditions disclosed by this new contraption are a bit disconcerting. With one of Sands's inspectors the roadmaster of a western railroad discovered 65 "failed rails" in three months on 58 miles of main line—not broken rails, you understand, but rails that certainly might break and cause wrecks. Another roadmaster, in 40 miles and in the same three months found 140 failed rails. None of these flaws, the two roadmasters believe, could have been detected in the ordinary manual inspection.

The Mirror Shows the Underside of the Rail.

Sands's inspector is so designed that one man, averaging two and three-quarters miles of track a day, may walk along, glancing into the mirror which is so suspended from a carriage riding on the rail as to reflect the underside of the ball of the rail and the web of rail as to reflect the actual condition and picture of the entire rail not visible to the eye from above.

Morse Birthplace No More

Word comes from Boston that the birthplace of Samuel Finley Breese Morse, inventor of the telegraph, has fallen before the wreckers. Soon a brick store block will efface the site of the landmark.

Thousands of visitors have found their way to 199 Main street, Charlestown, to read the modest inscription on the building.

The Morse house was once the home of David Wood, who built the place soon after Charlestown was burned by the British in 1775. Wood was one of the parishioners of Rev. Jedediah Morse and when the parsonage of the first church was being built in 1791 the Morses were the guests of Wood.

Thus it happened that Samuel Morse was born in the old house on April 27, 1791. He was the eldest and most distinguished child of the pastor's family, famed in later life for his versatility in the arts as well as for his great invention.

Many years ago a store front was added to the ground floor of the dwelling and merchants took up the lower story with their wares.

The casement about the fireplace in the chamber where Morse was born, with the Colonial stairway and balustrade, will be preserved by the Society for the Preservation of New England Antiques, along with the tablet that for many years drew the attention of sightseers.

Death Ends Career of Doctor Goss

A Much Loved Dean of Engineering

By W. H. Powers

Life's race well run,
  Life's work well done,
Life's crown well won,
  Now comes rest.
—*President Garfield's Epitaph.*

Dr. W. F. M. Goss

IN THAT charming book descriptive of Scottish village life, "Beside the Bonnie Brier Bush," one of the most interesting characters is Dominie Jamieson, the schoolmaster. "Domsie" as he was familiarly called, "had an unerring scent for 'pairts' in his laddies. He could detect a scholar in the egg, and prophesied Latinity from a boy that seemed fit only to be a cowherd." One of his boys who began by making a collection of insects, found himself after some years, in the British Museum, "the greatest living authority on beetles." Domsie "had a leaning to the classics and the professions," but "generally speaking if any clever lad did not care for Latin, he had the alternative of beetles."

"Domsie" was in advance of most of the educators of his time, and many of those of the present day. The idea that the same course of study is not equally good for all minds irrespective of their natural bent and their varying paths in life, is a modern one.

Until comparatively recent years no other education was provided by the institutions of learning, and the ambitious student whose tastes and desires led him into other than so called "culture studies" was obliged to take the full curriculum in order to get the benefit of a small measure of the special training his soul longed for, and then to depend upon other resources for fuller preparation for what he conceived to be his life work. The genius of modern education is its individualism.

Probably no man has done more for the advancement of technical education or the application of individualism in education than Dr. William Freeman Myrick Goss, who died unexpectedly at the Waldorf Hotel in New York City on March 23.

In 1880, after completing a recently established two-year course in mechanics arts at the Massachusetts Institute of Technology, Doctor Goss was appointed instructor in practical mechanics at Purdue University, and at once began there the work of establishing shop laboratories. His first class of five students was given instruction in the lines of work in which he himself had just been trained.

From a meager beginning, the outlook broadened rapidly. The equipment was extended, the number of students increased, and new shop laboratories were built. In 1883 he became professor of practical mechanics, a title which he held for seven years. When he began, there was no college west of the Allegheny Mountains giving systematic courses in shop practice, and there was no manual training work in any American high school. He devised courses of practice and developed series of lectures by means of which principles established in the shops could receive wider application. It was a day when school officials were becoming interested in training students in the manual arts, and many distinguished visitors came to see the work of the Purdue laboratories. Chicago, Toledo, Louisville and Indianapolis, sought its aid in establishing manual training schools. Certain forms of equipment, especially forges and lathes, originally designed and constructed at Purdue, were made and supplied as complete equipment to school boards in distant localities where new courses of shop practice were being organized. In many such ways the work at Purdue University had a most important part in ushering in an educa-

tional movement of unusual significance.

After ten years of this work, Professor Goss was given a leave of absence in 1889, and took up his residence in Boston, where he continued from April of that year to a year from the following September. Some work was done at the Massachusetts Institute of Technology, but the greater part of the time was given to self-directed reading and study. He was appointed professor of experimental engineering at Purdue in the spring of 1890, and in the autumn began the active duties of his new office. Having developed laboratories for elementary training, it was now his task to build laboratories for advanced engineering work. A steam engineering laboratory equipped with a compound Corliss engine and a few testing machines was soon in operation. Plans for an extensive engineering building were developed, and by the fall of 1891 a portion of the building was constructed.

A significant part of the equipment of this new laboratory was a testing plant designed to serve in an experimental study of locomotive problems in much the same way that an experimental stationary plant could be used in studying the problems of design affecting the performance of stationary engines. This plant was the first of its kind. It was designed in the summer of 1891 while the building to shelter it was in process of erection, and was in successful operation that fall. An incident in the process of installing this plant was that of transporting a 100,000-lb. locomotive over the corn fields and highways between the nearest track and the laboratory, a distance by the course taken of about a mile and a half.

The opportunities presented, attracted the attention of motive power men and of steam engineers. So meager was the information concerning the locomotive performance that every fragment of truth, however simple or easily obtained, at once became a matter of public interest. The evaporative capacity of the locomotive boiler, its efficiency at difficult rates of power, the power and efficiency of changes in speed or cut-off were all matters which, until this plant was built had been but little understood even by those best informed. The behavior of the various parts of the machine as a mechanism and especially the effects produced by the action of the counterbalance in the locomotive drive wheels were all matters concerning which people had theories, but which were first actually developed by the accurate processes of the laboratory at the Purdue plant.

Associations of railroad men gave their encouragement and sometimes financial assistance to increasing the output of the new testing plant. The Master Car Builders' Association made the Purdue laboratories its official testing station, and was instrumental in installing there a considerable amount of useful and expensive apparatus. The laboratory became an active center for testing not only locomotives, fuels and lubricants, but also details of car construction such as wheels, axles, draft gears, couplers and brakeshoes. The problems awaiting solution were always numerous, and the professor in charge was kept busy outlining the means to be employed in solving them. He was responsible in the beginning not only for the effective use of the railroad equipment to which reference already has been made, but also for developing laboratories and courses in materials testing, in hydraulics and in the general field of theoretical and applied thermodynamics. He erected buildings, purchased and installed equipment, and in many cases the equipment installed was of his design, and he was required to meet the reasonable expectations of an ever increasing body of students. Hundreds of men who were students at Purdue in the early nineties can testify to the variety of the activities which in their day were in progress in the engineering laboratories.

Professor Goss was again granted a year's leave of absence in 1899 and spent the time in travel and study abroad, chiefly in Germany. Upon his return he was appointed dean of the Schools of Engineering, an office which he continued to hold throughout the remaining eight years of his residence at Purdue. He resigned his position at Purdue in 1907 after twenty-eight years of service, to become dean of the College of Engineering of the University of Illinois.

To many engineers however scattered over the world, graduates of Purdue, men occupying some of the most important positions in our transportation industry, men who, through their early training at the university are doing great work in the advancement of the science of engineering, Doctor Goss is not forgotten. He is not to them just the professor they met in the class room. To them his degree of doctor of engineering, conferred upon him by the University of Illinois means little. In their hearts and in their conversation he is "Daddy" Goss, the man who always had time to counsel and advise them in the formative years when advice means so much in developing ones life's work and character. "Daddy" Goss never lost his interest in his boys; his office and his home, even after he gave up scholastic work, always had the welcome sign out. Always quiet, always gracious and willing to listen to other men's troubles, to counsel and advise them judiciously. An hour at any time spent with him was sure to be inspiring.

Doctor Goss's life work, however, was not confined to educational lines, he was always deeply interested in engineering and its commercial manifestations, and it was this interest that broadened his educational work by bringing the two into closer relationship. He was a member of numerous scientific and technical organizations, among them the American Society of Mechanical Engineers; Association for Testing Materials; Society for the Promotion of Engineering Education; executive committee of the National Advisory Board on Fuels and Structural Materials; Illinois Academy of Science; Western Society of Engineers; Master Car Builders' and Master Mechanics' Association; Jury of Awards, Columbian Exposition; fellow of the American Association for the Advancement of Science; member and past president, Western Railway Club, and chairman of the advisory committee of the Pennsylvania Railroad charged with testing locomotives at the Louisiana Purchase Exposition.

Always a devoted student of the locomotive, Doctor Goss wrote several books pertaining to that subject and contributed numerous papers before convention and club meetings which required a tremendous amount of time and study.

Probably one of the outstanding investigations which he headed was conducted in 1913 when he served as chief engineer of the Chicago Association of Commerce committee of investigation on smoke abatement and electrification of railway terminals.

Doctor Goss resigned from the University of Illinois in 1917 and became president of the Railway Car Manufacturers' Association which position he held until 1925 when he retired.

Funeral services were held March 25 in New York City following which the body was taken to Barnstable, Mass., the doctor's birthplace where he had been living since his retirement from active business. Doctor Goss was 68 years old. He is survived by his widow, Edna Baker Goss, and a daughter Mrs. F. S. Cannon.

Steel Vessels Increasing

American shipyards were building or under contract to build for private shipowners, 283 steel vessels of 179,502 gross tons, compared with 261 steel vessels of 184,945 gross tons of February 1, 1928.

There were 67 wood vessels of 27,243 gross tons building or under contract to build for private shipowners during the same period, compared with 66 wood vessels of 28,564 gross tons on February 1, 1928.

This Is One of the New Twelve-Passenger Planes Now in Daily Service Between San Francisco and Los Angeles.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

NOT SO very long ago persons thought to be normal in every respect used to say passenger service by airplane was either a very long way from realization or never would be achieved. But here it is, looking for business.

Regular service for passengers between Los Angeles and San Francisco is to begin April 14 when the Maddux Air Lines will establish the longest strictly passenger air line service, on daily schedule, in the United States, with twelve-passenger, three-motored, all-metal Ford parlor monoplanes costing about $60,000 apiece. The line will reach from San Diego to Oakland. Stops will be made on reservation at Bakersfield, Fresno, San Jose, Santa Ana and Long Beach. Luncheon will be served while flying.

The principal terminals will be Rogers Airport in Los Angeles' Maddux Airport, opposite the Marine Base in San Diego, and the Bay Farm municipal airport in Oakland.

Operation of the San Diego-Los Angeles line started on a tri-weekly schedule about six months ago. From two to four round trips on Saturdays and Sundays have been made recently to handle week-end traffic. The increase, company officials said, has excelled any record of a passenger air-line in the United States during a similar early period.

Approximately 50 per cent of the passengers were said to be salesmen, sales managers, contractors and others who in their business can realize a profit on quick airline contracts.

On the first official trip three of the planes will fly over the route together, one leaving San Diego at 8 a.m., and the three departing from Los Angeles at 9:30 a.m.

The daily schedule thereafter will be as follows:

Northward, leave San Diego at 8 a.m.—arrive Los Angeles 9:15 o'clock—Bakersfield, 10:50 o'clock—Fresno, noon—San Jose, 1:25 p.m.—and Oakland at 1:45 o'clock.

Southbound, leave Oakland at 9:30 a.m.—arrive San Jose, 9:50 o'clock—Fresno, 11:10 o'clock—Bakersfield, 12:20 p.m.—Los Angeles 1:45 o'clock.

The plane from the north will hold over from 1:45 to 4:30 p.m. in Los Angeles, arriving in San Diego at 5:45 o'clock. Additional service to San Diego at 1:45 o'clock will depend on reservations.

Charter and sightseeing tours will be handled as before by the company, with additional equipment.

Negotiations are under way for speedboat accommodations at low cost from the airport on the bay in Oakland to the foot of Market street in San Francisco.

Why, Henry Ford, the Idea!

Henry Ford's Detroit, Toledo & Ironton Railway was indicted by the federal grand jury on 50 counts March 20 charged with violation of the Elkins law on demurrage charges. Every count carries the possibility of a maximum fine of $20,000 and the minimum of $1,000. In total, the railroad stands open to a $1,000,000 fine.

According to evidence given the grand jurors, the D., T. & I. failed to charge demurrage against the Raymond Concrete Pile Co. in May, 1925, as required by law.

Demurrage levies, as enforced by the Interstate Commerce Commission, call for a rental to be paid on freight cars after a certain limited time on a siding.

Generous Homer Loring

Homer Loring, retiring chairman of the executive committee of the Boston & Maine Railroad, who took over the reorganization of the road in 1924, has

given $100,000 voted him by the board to establish a trust fund for the "general good of all employes." Loring, who had served without compensation, told the board he would accept the $100,000 only to return it in the form of a trust.

Trading Trains for Buses

If it costs you $1.10 a mile to operate a branch train, and the revenue is only 23 cents a mile you don't feel very enthusiastic about continuing the service. Still, this is the situation for the railroads in many places; and they can't quit, either, until the state gives permission. If this is given the Southern Pacific Co., intends to take off two trains and put on bus service for Gridley, Cal. That company's representatives are talking to Gridley people and those of other towns to be affected by the proposed change.

Turning the Dog Around

A second proposal for the consolidation of three principal trunk-lines in southwestern territory was presented to the Interstate Commerce Commission March 15. The Missouri-Kansas-Texas sought the commission's approval for its acquisition of control of the Kansas City Southern and the St. Louis Southwestern systems, under an arrangement to transfer and purchase of stock.

The proposal brought forward would result in fusion of the three railroads along a somewhat different line than that suggested two years ago by L. F. Loree and his associates, which met with the commission's disapproval.

The first merger project called for the amalgamation of the three roads under the leadership of the Kansas City Southern, to which the commission objected.

U. P. Fine Safety Record

An astonishing record for safety has been announced by the Union Pacific System as the result of final computations of all its accident reports for 1927 over the entire system. All previous records for safety in railroad operation were eclipsed in the past year, according to the information issued by President Gary.

Calculated in millions of working hours for employes the injuries to employes for the year amounted to 3.44 per each 1,000,000 hours. The 1926 rate of 4.73 for 1,000,000 hours, which was the lowest ever achieved up to that time, was improved by 27 per cent. Any injury causing an employe to be absent from work for three days was counted in the calculations.

The passenger record is equally impressive. During the year there was not a single fatality to a passenger and only 16 passengers were hurt, including accidents in which either the railroad or the passenger himself was responsible. Any injury disqualifying a passenger for as little as one day was rated as a passenger injury.

Passenger injuries are calculated on the basis of 1,000,000 miles of travel and the record just established is at the rate of .017 in 1,000,000 passenger miles.

The K. C., M. & O. to Extend

Application has been made to the Mexican government by the Kansas City, Mexico & Orient Railway for a permit to construct a bridge across the Rio Grande to connect Del Rio, Texas, with Villa Acuna. This action is taken to mean that the railroad plans to carry out in the near future its original project of constructing a branch line from San Angelo to Del Rio, approximately 120 miles. The roadbed for this line was graded nearly all the way before the railroad fell into financial difficulties several years ago. At Del Rio the line would intersect the Southern Pacific's transcontinental road. The establishing of a new through mail route into Mexico would be obtained by completing the extension of the branch line of the National Railways of Mexico from San Carlos to Villa Acuna, 22 miles.

Millions for Employe Benefits

The annual report of the Pennsylvania Railroad's voluntary relief department for 1927 shows that benefits totaling $4,635,284 were paid out of the relief fund during the year to employes and members of their families. The operating expenses of the relief department were borne by the railroad company so it was possible to apply all employe membership dues directly to benefits. Included in these expenses, paid out of the railroad's treasury, were all charges for surgical and medical attention to employes; examinations, physical tests and other similar services.

The department at the close of the year had on hand assets totaling $7,259,883 consisting of securities carried at their cost, $5,663,326, and cash on deposit $1,596,556. Membership in the fund showed a decrease in 1927 due to a reduction in the number of employes, as a result of the decline in railroad traffic.

Naval Engineers' Medal Awarded

The medal of the American Society of Naval Engineers for the best article submitted during 1927 has been awarded to Henry F. Schmidt, consulting engineer of the Westinghouse Electric & Mfg. Co., South Philadelphia Works. Besides receiving a gold medal, an honorary life membership in the society and a cash prize were given Mr. Schmidt for his excellent and well-illustrated paper, entitled "Some Screw Propeller Experiments With Particular Reference to Pumps and Blowers."

The presentation of the awards to Mr. Schmidt was made by Secretary of the Navy Wilbur at the annual dinner of the society March 29, at the Willard Hotel, Washington.

Buses for Alameda

The Key System, according to W. J. Locke, city attorney, has notified Alameda, Cal., that it has no intention of putting tracks through the tube or repaving its right-of-way along Webster street. The company also, according to Mr. Locke, will apply within the next few days to the railroad commission to abandon its railway franchises in Alameda. Alameda county officials said recently that it is understood the Key System intends to substitute bus lines for its Alameda railway.

The P. E. Into Joint Agency

The Pacific Electric Railway has joined the joint railroad agency operated by the Santa Fe, Southern Pacific and Union Pacific railroads in the central manufacturing district of Los Angeles, completing the railroad service for shippers and receivers of freight throughout the section reached by the Los Angeles Junction Railway. The action took place March 1.

Announcement also was made that the name, Los Angeles Union Stock Yards, which has been the official railroad identity by which this station was known, has been changed to read Junction Station.

Another Air Line for Passengers

Western Air Express has added three new large planes to its fleet of passenger ships and has announced that service will be opened between San Francisco and Los Angeles about May 1. This company operates at present between Los Angeles and Salt Lake.

Omaha Bus Traffic Gains

The extent to which railroads of the Missouri Valley are "up against" the bus and truck business is indicated by reports just made by the Omaha chamber of commerce which show that more than 50,000 persons arrive and leave Omaha by means of public buses every month. This does not include those traveling by private automobile. Omaha is building two passenger bus terminals, one at a cost of $300,000 and the other at $200,000. Passenger traffic via bus is expected to double this summer by reason of completion of paving in west-

ern Iowa and eastern Nebraska. Competition is not restricted to passenger buses. Forty-two freight truck lines are operated out of one depot alone in Omaha. Arrivals of live stock at the South Omaha stock yards total more than 300,000 head annually. All this traffic formerly moved by steam railroads.

Seaboard to Serve Big Rayon Plant

Grading for the spur line of the Seaboard Air Line which will be built to "Ampthill," where the du Ponts will construct a rayon plant costing approximately $8,000,000 is expected to be begun within the next few weeks. With the spur line built, construction of the first unit of the huge artificial silk plant can be started. The rayon plant, which will be a few miles from Richmond, in Chesterfield County, will provide employment for between 3,000 and 5,000 men and women. It will constitute Richmond's greatest industrial development in many years.

S. P. Adds to Budget

In addition to the $11,000,000 construction program of the Southern Pacific Co. under way the first of the year, $20,000,000 for improvements and new equipment has been authorized by the board of directors of the company, H. W. De Forest, chairman, announced March 15. The result of expenditures in the past three years has not been reflected in the earnings for 1925 and 1926, and only partly in 1927, he said. During this time the company has made large capital expenditures for new lines, double tracking, new equipment, and miscellaneous additions and betterments. These expenditures, according to Mr. De Forest, should insure greater economy of operation and the opening up of additional producing territory.

Included in the improvements already authorized or under consideration, is the completion of construction work in the Rio Grande Valley of Texas and the relocation of the Globe branch on account of construction of the Coolidge Dam in Arizona. The company is extending the double track work of its subsidiary, the California & Oregon Railroad, and is expanding freight yard and terminal facilities in various cities, besides laying heavier rails and purchasing new equipment.

S. P. Earnings Down

The annual report of the Southern Pacific Co. for 1927 shows that property earned only $9.67 a share for its capital stock, a reduction of $1.62 a share under 1926. President William Sproule says this is due to a general slowing down of business in the last half of the year; a short cotton crop, and automobile competition. Total net income of $35,999,196.81 is reported by the company and its subsidiaries for the year, a decrease of $6,035,467.94 as compared with similar figures for 1926. The decline is equivalent to a drop of 14.36 per cent.

Stockholders are further informed by President Sproule's report that decreases in railway operating revenues were accompanied by an increase of $2,583,712 in railway operating expenses, about $2,000,000 of which represented increases in wage rates awarded by United States arbitration boards without any corresponding increase in transportation rates.

Passenger revenue decreased $2,021,402, or 3.66 per cent, of which $1,149,815 is allocated to the Pacific lines, $864,623 to Texas and Louisiana lines and $6964 to the Southern Pacific steamship lines.

Engineering Congress in Tokio in 1929

The department of state at Washington announces preliminary plans for a world's congress of engineers to be held in Tokio late in October, 1929. The congress will be under the auspices of the Engineering Society of Japan. Secretary Herbert Hoover is chairman of the American committee of arrangements for this country.

California Tax System is Denounced

Attorneys for electric railways in Southern California protested, recently, before the state tax commission against the present system of state taxation. No electric railway in California, the attorneys said, is making a fair return on its investment.

W. D. Hill, representing the Electric Railways' Association, urged a substantial cut in the gross receipts tax now 5½ per cent. He said, too, that relief should come from stringent paving requirements imposed on the railways, and expressed the belief that municipally owned public utilities should be taxed in proportion to assessments levied on privately owned utilities. In his opinion no state electric railway was making in excess of 5 per cent of its investment and most of them were making only 1 per cent.

Pitt Hand Has Quit

Pitt P. Hand, publicity manager of the New York Central Lines, with headquarters at New York, has resigned, and C. W. Y. Currie has been appointed acting publicity manager.

Southern Shifts 1000 Men

Transfer of more than 1,000 officers and employes of the Southern Railway from Washington to Atlanta has been announced by President Fairfax Harrison. These men constitute more than half the forces now maintained in Washington. To accommodate them an adequate and convenient addition will be made to the Southern's present Atlanta office building. While the executive headquarters of the Southern will continue to be in Washington, much of the detailed work hereafter will be carried on elsewhere, particularly in Atlanta. The government has decided to acquire for public buildings property including the Washington offices of the Southern, and the decision to transfer much of the personnel to Atlanta followed the legislation. For the executive offices a new building is to be put up in Washington on a site already obtained. The change means that Atlanta will house nearly 1,200 of the 3,200 members of the general office staff of the system now distributed among Washington, Richmond, Cincinnati, Atlanta, Chattanooga and Charlotte.

Waycross, Ga., Can't Tax Buses

Judge J. D. Blalock of the Waycross, Ga., judicial circuit, has made permanent an order restraining the city of Waycross from taking any steps to collect the license or occupation taxes upon automobile bus lines operating into and out of Waycross. Judge Blalock said the intent and purpose of the general tax act of 1927, paragraph 75, was to prevent municipalities from levying a business or occupation tax upon persons operating motor buses from city to city. He said the license tax levied by Waycross is such a tax, being neither a fee for the expense of some necessary police regulation, nor a toll for the use of the city streets. The decision goes on to say that the nature of the bus line business is such that if the various municipalities through which they pass were authorized to assess occupation taxes they could practically prohibit their operation. If Waycross has the right all municipalities probably have such a charter right.

'Frisco Would Acquire Lines

The St. Louis-San Francisco has applied to the Interstate Commerce Commission for authority to acquire control of the Kansas City, Fort Scott & Memphis; Kansas City, Memphis & Birmingham; Kansas City, Clinton & Springfield; Muscle Shoals, Birmingham & Pensacola, and the Kansas City & Memphis Railway & Bridge Co. The 'Frisco owns capital stock of these lines but will assume obligation and liability with respect to outstanding bonds and notes.

Missouri Pacific Leases Line

The Chester & Mount Vernon Rail-

road has been authorized by the Interstate Commerce Commission to acquire railroad properties formerly owned by the Wabash, Chester & Western Railroad in Illinois, and at the same time has authorized the Missouri Pacific to acquire control of the Chester & Mount Vernon line by lease.

The Chester & Mount Vernon Co. was authorized to issue $250,000 first mortgage 6 per cent 20-year bonds, $150,000 preferred stock and $100,000 common stock.

Chicago Surface Lines Increase

The Chicago Surface Lines, operating under temporary municipal permits during the fiscal year Feb. 1, 1927, to Jan. 31, 1928 reports that gross earnings were $61,624,752, an increase of $451,151 compared with the previous year. This total was the highest in the history of the companies. Operating expenses, including taxes and renewals, were $48,241,496, an increase of $360,006. Total rides for the year reached 1,585,441,127, an increase of 10,471,225, while the revenue passengers totaled 882,458,647, an increase of 6,208,984 over the previous year. Service was increased during the year to the extent of 3,200,000 passenger car and bus miles.

C. & N. W. Valuation

A final valuation of $487,870,700 for the Chicago and North Western Ry., as of June, 1917, was fixed March 10 by the Interstate Commerce Commission.

The company contended for a valuation of $508,321,494.

The North Western's capitalization on the valuation date was $370,132,258, while its book investment was $388,671,654.

If the commission's figures stand the final test of court litigation they will represent a base for the making of rates on the North Western.

Panama Canal Traffic

Panama Canal traffic during the first 15 days of February exceeded that of any half month period in the history of the canal. Commercial vessels to the number of 307 passed through the water way, paying tolls amounting to $1,271,850.

Automatic Train Stop Approved

The Interstate Commerce Commission has approved the automatic train stop device of the National Safety Appliance Co. on the San Antonio sub-division of Houston division of the Galveston, Harrisburg & San Antonio Ry.

Oppose Bus Lines in Ohio

Railroads in Ohio continue to oppose issuance of additional certificates of operation to bus lines on the ground they will deprive the roads of business. The Toledo, Bowling Green & Southern Traction Co. has filed a protest with the public utilities commission against a certificate to Amanda M. Harris to permit operation of a bus line between Toledo and Findlay.

Larger roads are fighting the inroads being made into their business by the network of bus lines running across the state. Many of these buses now offer sleeping berths for night travel. Short railroads are feeling the competition more than longer lines and many have asked the commission for permission to take off trains to reduce expenses.

The Long and Short of It

The Colorado public utilities commission has suspended, pending hearings and investigation, new schedules of freight and passenger rates filed by the Denver & Salt Lake, operating through the Moffat tunnel. The proposed rates give no reductions in carrying charges though the road, by operating through the tunnel instead of over the grades of Corona Pass, is 23 miles shorter. Railroad officials assert that tunnel maintenance costs and rentals offset gain effected by saving in distance.

M-K-T Proposed Improvements

The Missouri-Kansas-Texas Ry., will spend about $4,500,000 in Texas this year according to H. E. McGee, vice president and general manager.

"Budget plans do not contemplate the purchase of any new equipment," said Mr. McGee, "but more than $1,000,000 will be expended for improvement of present equipment, and in excess of $3,500,000 will be put in improvement of roadway and structures. The budget does not carry any large improvement projects.

"Laying new rail and ballasting probably will call for the largest expenditures, $769,346 being provided for rail laying and $432,700 for ballasting. A total of $758,125 will be expended for improvement of bridges and trestles, $303,050 for line and grade revisions and $227,393 for shop machinery and tools."

Freight Movement Some Slower

The average daily movement per freight car in January this year was 27.6 miles, a decrease of nine-tenths of a mile under the daily average for the same month last year, the bureau of railway economics announced April 1. The average daily movement per freight car in January, this year, was the same as that for January, 1926.

In computing the average daily movement account is taken of all freight cars in service, including cars in transit, cars in process of being loaded and unloaded, cars undergoing or awaiting repairs and also cars on side tracks for which no load is immediately available.

The average car load in January, 1928, was 27.2 tons, including less than carload lot freight as well as carload freight. This was a decrease of 1.2 tons under the average for January, 1927, and a decrease of four-tenths of a ton under that for January, 1926.

Freight Ton Miles Down

Freight traffic handled by the Class I railroads in January amounted to 36,271,193,000 net ton miles, according to reports just received from the railroads by the bureau of railway economics. Compared with January, 1927, this was a decrease of 2,961,323,000 net ton miles or 7.5 per cent. It also was a decrease of 1,404,444,000 net ton miles or 3.7 per cent under January, 1926. In the eastern district, there was a decrease of 12.6 per cent in the amount of freight traffic handled in January compared with the same month the year before while the southern district reported a decrease of 8.8 per cent. The western district reported an increase of eight-tenths of one per cent.

Ocean Line for Milwaukee

Milwaukee, for the first time will have regular ocean marine freight service with weekly sailings this season. The American Shipping Co. of New York will operate a line of freighters from the Great Lakes to West Indian ports. Walter J. Fitzgerald of Milwaukee, western agent, says that if business warrants ships also will be sent to South American ports. The freighters will be of a size to travel through the Great Lakes canals and the St. Lawrence River, carrying about 2,000 tons to inland ports and nearly twice that after clearing the fresh water ways outbound.

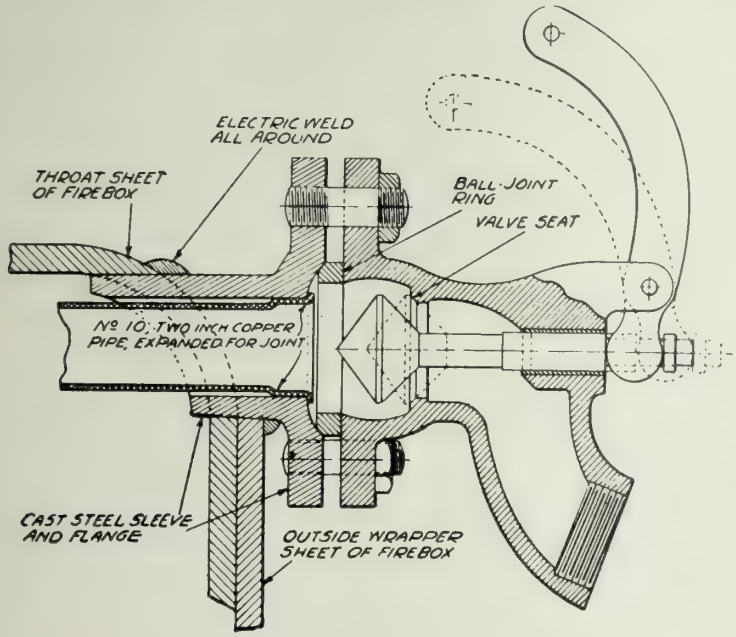
Refrigerator boat service is also planned. One of the principal commodities brought in will be aluminum ore for Manitowoc and Two River plants. Automobiles and parts, iron and steel goods and clothing will be among leading products transported. The first ship will dock in Milwaukee shortly after navigation opens on the lakes May 1. If the West Indies line is a success, other ocean shipping concerns are expected to send ships there.

Nothing to the K. C. M. & O. Case

The investigation of the affairs of the Kansas City, Mexico & Orient Ry., which has been rumbling around for quite a while, dropped to pieces March 7, at St. Joseph, Mo., when the federal grand jury reported no bill. This road

B-A-CO.'S SLUDGE REMOVER

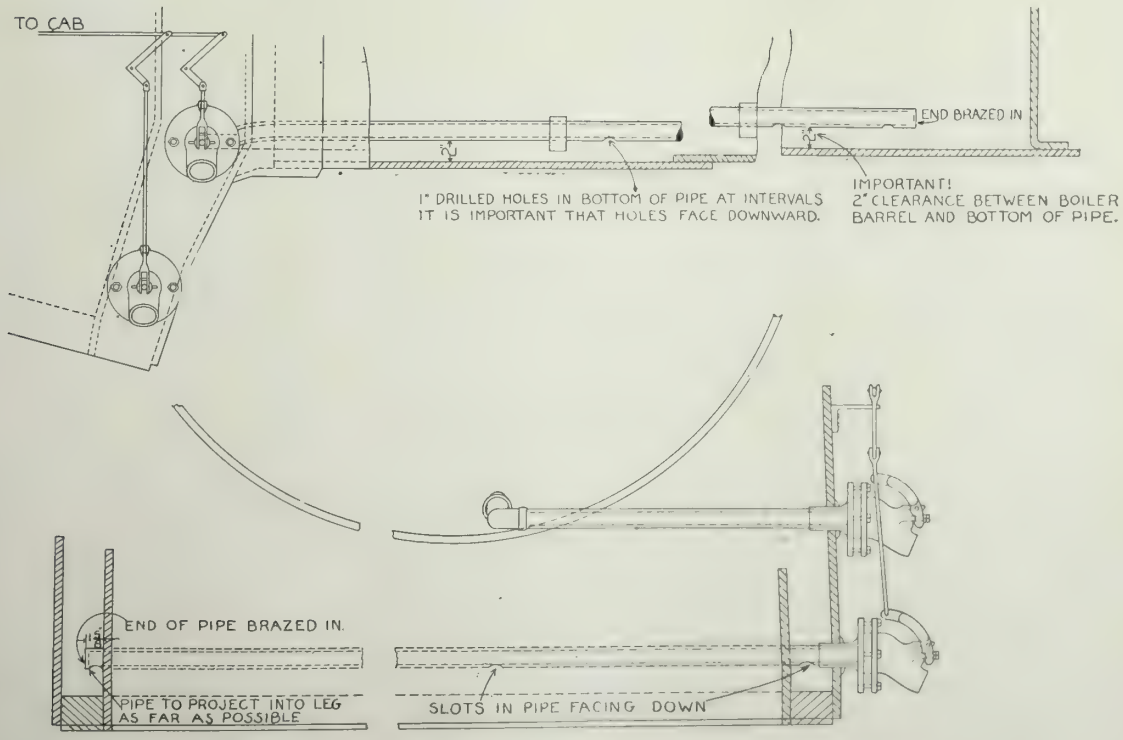
MEANS—Better Engine Performance—Less Fuel Consumption



Details of Piping and Mounting of Apparatus

A CLEAN boiler, like a clean conscience, means freedom from a lot of worry. Every locomotive man knows what these troubles are: Scale formation, foaming, corrosion, boiler tube and firebox leaks.

It is also realized that removal of the sludge, even with the blow-off cocks alone, will greatly relieve these troubles, especially where chemical treatment to throw down scale-foaming solids is used. The B.-A. Co. Sludge Remover multiplies this relief many times over.



THE BIRD-ARCHER COMPANY

Manufacturers of Supplies of Boiler Chemicals for Water Treatment

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PHILADELPHIA	CHICAGO	ST. LOUIS	MONTREAL
2nd & Bristol Sts.	122 So. Michigan Ave.	Frisco Bldg.	McGill Bldg.

is one of the seven railroad projects of A. E. Stilwell. Much of the money for the Orient came from Dutch and English sources. The property fell into bankruptcy and W. T. Kemper became receiver. In March, 1925, some English note-holders complained against Mr. Kemper's conduct of the company's affairs, particularly in getting an extension of a loan from the government for $2,500,000. When this loan became due in 1925 the Orient had no money to pay principal or interest. Since then, however, Mr. Kemper has scraped together a half million dollars through the settlement of claims, and has turned it over to the road's treasury. The Orient is no longer in the court's hands, and is making a brave struggle to get business and keep out of the red ink.

The Pere Marquette Has Plans

The Pere Marquette Railway Co. will spend approximately $5,000,000 for improvements and betterments this year. Some of the items appearing in the budget for 1928 may be carried over into the ensuing year. The budget is progressive. The extensions to the Flint Belt Line, undertaken last year, will provide a double track between Mt. Morris and Grand Blanc when completed. This second track work represents an estimated outlay of $345,000 for 1928.

The largest item appearing in the budget is $996,000 for grade separations, Pere Marquette's proportion of the cost of these projects. Railway equipment to be purchased comprises 20 30-yard steel dump cars, a Jordan spreader ditcher, and a double-end rail unloader, representing total expenditure of $119,000. Thirty additional locomotives are being equipped with train control devices for operation on those sections where train control has already been installed on the tracks.

Net Goes Up, But Return Goes Down

Net railway operating income of 186 Class I railroads in February amounted to $70,064,223, which for that month was at the annual rate of return of 4.79 per cent on their property investment, according to reports filed by the carriers with the bureau of railway economics. In February, 1927, their net railway operating income was $69,516,412 or 4.89 per cent on their property investment. Property investment is the value of road and equipment as shown by the books of the railways, including materials, supplies and cash. The net railway operating income is what is left after the payment of operating expenses, taxes and equipment rentals but before interest and other fixed charges are paid.

Gross operating revenues for February amounted to $456,593,283 compared with $469,565,403 in February, 1927, a decrease of 2.8 per cent. Operating expenses in February totaled $348,498,198 compared with $361,844,037 in the same month in 1927 or a decrease of 3.7 per cent.

Class I railroads in February paid $28,868,556 in taxes, a decrease of $411,367 or 1.4 per cent under the same month in 1927. This brought the total tax bill of the Class I railroads for the first two months in 1928 to $57,401,454, a decrease of $1,361,813 or 2.3 per cent below the same period in 1927.

Twenty-seven Class I railroads operated at a loss in February of which 12 were in the eastern, three in the southern and 12 in the western district.

Airplanes and Engines Exports

United States domestic exports of aircraft engines and parts increased in 1927 and were valued at $1,903,560 or 85 per cent more than the 1926 and 143 per cent more than the 1925 value. Twenty countries purchased these products in the United States in 1927 to the value of $10,000 or more in each case. The leading countries were Canada, Peru, Chile, Soviet Russia, Belgium, Germany, Japan (including Chosen), United Kingdom and the Philippine Islands.

Sixty-three airplanes and seaplanes valued at $848,568; 84 engines worth $484,875 and $570,117 worth of parts except tires were exported during the year.

During the three years 1925, 1926 and 1927, 47 countries purchased aircraft engines and parts to the value of $3,714,429. The leading purchasers during this period were Canada, Peru, Soviet Russia in Europe, United Kingdom, Chile, Argentina, Germany, Philippine Islands, Mexico, Cuba, Colombia, Belgium, Brazil, Japan (including Chosen), Siam, China, Australia, Netherlands, Honduras and Nicaragua.

The 193 aircraft exported during the three years were valued at $1,662,999 and the 454 airplane engines were worth $1,229,400. Peru, Canada, Chile, Argentina, the Philippine Islands and Cuba were the chief purchasers of aircraft while Soviet Russia, the United Kingdom, Canada, Germany and Belgium were the principal takers of engines. Aircraft parts were distributed to 40 countries. (Prepared from reports of the division of statistics, bureau of foreign and domestic commerce.)

Frisco Activity in Texas

In keeping with the authority granted to the St. Louis-San Francisco Ry. Co. by the I.C.C. to take over the Paris & Great Northern, the railroad commission of Texas has issued an order making the transaction effective. The Frisco was also authorized by the railroad commission to issue $171,000 of capital stock to be given in exchange for $500,000 capital stock of the Paris & Great Northern, and to assume $339,000 of its bonded obligations. In 1923 the legislature of Texas authorized the Texas Frisco system to acquire the Paris & Great Northern, the Fort Worth & Rio Grande, the Quanah, Acme & Pacific and the Brownwood North & South, the last having since been junked.

Railroads to Take Over Express Business

Railroads handling 75 per cent of the country's express business have approved the proposal that the carriers should take over the express traffic when contracts with the American Railway Express Co. expire next February, according to New York despatches April 3, quoting W. B. Storey, chairman of the committee on uniform express contracts of the American Railway Executives' Association.

With the exception of the Southern Railway, which has its own express company, it is expected in Wall street that all other roads will consent to the plan.

Fuel Meeting Is to Be Held May 8-11

The twentieth annual convention of the International Railway Fuel Association will meet in Chicago May 8 to 11 inclusive at the Hotel Sherman. Delegates should remember that while this is a railroad meeting its program will run on daylight saving time which is one hour faster than central standard time. The complete program as now announced follows:

May 8, 11 *a.m. General session.* Addresses by President J. E. Davenport; T. W. Evans, vice president, Indiana Harbor Belt R. R., and Samuel Wyer, consulting mining engineer.

2:30 *p.m. Technical session.* Reports from committees on steam turbine locomotives, stationary power plants, and on Diesel locomotives.

May 9, 9:30 *a.m. Operating session.* Address by Col. F. W. Green, vice president, St. L. & S. W. Paper by Dr. J. H. Parmelee, director, bureau of railway economics. Report of committee on fuel bulletins. Paper by K. F. Nystrom, superintendent of car department, C. M. St. P. & P. Ry.

2:00 *p.m. Firing practice session.* Report of committee on locomotive firing practice, and discussion.

May 10, 9:30 *a.m. Mechanical session.* Address by W. L. Bean, mechanical superintendent, New Haven System; paper by W. E. Woodward, vice president, Lima Locomotive Works, "The Possibilities of Future Locomotive Design." Paper by A. W. Bruce, designing engi-

neer, American Locomotive Co., Paper by Lawford Fry, M. E. Standard Steel Works Co.

2 *p. m. Mechanical.* Address by A. G. Pack, bureau of locomotive inspection, I. C. C. Reports from committees on new locomotive economy devices, and on front ends, grates and ash pans.

May 11. *Fuel supply.* Address by E. L. Mahan, president National Coal Association. Reports from committees on fuel stations; accounting, distribution and statistics, and on inspection, preparation and analysis of fuel.

2 *p.m. Business.* Report of committee on constitution and by-laws; election of officers; officers' reports.

Another "Friendly" Complaint

Complaint has been filed by the I.C.C. against the M-K-T Ry., charging violation of section 7 of the Clayton Anti-Trust Law in acquiring stock of the St. Louis-Southwestern Railway. The complaint is based on an agreement made by the railroad with the Central Union Trust Co. of New York for 135,000 shares of preferred stock and 20,000 shares of common of St. Louis-Southwestern without the approval and authorization of the commission. The effect of this acquisition of stock, the complaint states, "may be to lessen competition between the M-K-T and the St. Louis-Southwestern and to restrain commerce in certain sections and communities." The road is requested to appear before the commission on May 1, and show cause why an order should not be entered requiring it to divest itself of all interest, direct or indirect, in stock of St. Louis-Southwestern, "now unlawfully held." At the same time the commission postponed from April 2 to an indefinite date time for hearing on a similar complaint against the Kansas City Southern issued some time ago.

Business Improved, Says Hoover

Business conditions over the United States are showing a general betterment over recent months, in the opinion of Secretary Hoover. One of the key lines of industry watched by the department observers, Mr. Hoover added, is the production of machine tools. Equipment of this description is being more eagerly sought now than for months and the output is increasing in response to the call of industry generally for more equipment and greater production.

Further, the total of construction now under way in the United States is reported as about 13 or 14 per cent higher than one year ago. There will be an indirect influence from undertakings of this character, the secretary predicted, working to stimulate other activity in trade and commerce.

Good News From the Santa Fe

Common stock of the Atchison, Topeka & Santa Fe Railroad was placed on a $10 annual basis April 3, when directors declared a quarterly dividend of $2.50. The company heretofore had been paying $7 annually, with an extra of $3. The quarterly payment will be made June 1 to holdovers of record May 4.

Bessemer Medal to Schwab

The Bessemer medal for industrial leadership is to be awarded to Charles M. Schwab, May 5. He will be the first American to receive this distinction since the medal was first presented in 1860 by Henry Bessemer. Mr. Schwab sails for Europe April 25, on what will be his 78th crossing of the Atlantic.

Gain by Great Northern

Gross revenues and net operating income of the Great Northern Ry. for February showed a larger percentage gain than any other major system in the Northwest except the Milwaukee. It exceeded in this respect Northern Pacific, Union Pacific, Chicago & North Western, and Soo system. February increase in gross was $860,973 or 13 per cent and the increase in net operating income was $526,272 or 91 per cent. For the first two months gross gained $1,125,719 or 8.4 per cent and net $600,593 or 68 per cent.

B & M Increases Net

The Boston & Maine earned a net income of $486,368 in February, compared with $198,627 in February last year. Favorable weather conditions entered into the improved showing, making possible better operating efficiency and freer movement of freight traffic to the railroad. The ratio of operating expenses to operating revenue was reduced to 74.26, the best February operating result since 1916.

While freight revenue increased $156,661, passenger revenues showed a continued decrease of $171,876. Railway operating revenues generally were $48,453 less than in February last year. The principal saving in operating expenses was by improved efficiency in matters entering into the transportation account. An abnormally low snow-removal cost, $70,000 against $176,000 last year, also assisted materially.

Railway Construction

Tracks and Yards

CALIFORNIA.—The Sacramento Northern, it is reported, will construct a 36.2-mile line between Petaluma and Willotta, Solano county, and a 7-mile branch from a point between Armijo and Vacaville to Creed.

The Union Pacific plans the construction of new bridges over the San Gabriel River and the Rio Hondo to cost about $400,000.

GEORGIA.—The Atlantic Coast Line has completed the laying of heavier rails between Albany and Thomasville, having used 100-lb. rails for 25 miles, and 85-lb. rails for the remainder of the distance.

ILLINOIS.—The Pennsylvania, during February, laid 500 tons of 130-lb. rail on the Chicago Terminal division main tracks replacing 100-lb. rail.

MICHIGAN.—The Detroit, Grand Haven & Milwaukee has permission from the I. C. C. to construct an 8.88-mile line from Royal Oak to Bloomfield to cost about $3,071,350, and to abandon its present line between those points.

The Detroit, Toledo & Ironton has awarded a contract to A. Guthrie & Co., St. Paul, for reinforced concrete abutments over highways on the Malinta-Durban cutoff in this state and Ohio.

MINNESOTA.—The Milwaukee plans to elevate its tracks across streets between its station and East 26th street in Minneapolis at a cost of about $4,000.00.

MISSOURI.—The Rock Island has begun an addition at Kansas City to the Armourdale yard to involve, with the laying of track, about $100,000.

MONTANA.—The Great Northern has been authorized by the I. C. C. to construct a 75-mile branch from Saco to a point near Turner.

NEVADA.—The Union Pacific plans the double-tracking and lining of two tunnels near Caliente at a cost of $375,000.

NORTH CAROLINA.—The High Point, Thomasville & Denton has asked the I. C. C. for permission to construct a 20-mile extension from High Point to Winston-Salem.

OHIO.—The Baltimore & Ohio has awarded a contract to the Vang Construction Co., Cumberland, Md., for grading yard tracks at Maplewood, at a cost of $30,000.

OKLAHOMA.—The Beaver, Meade & Englewood Corpn., now operating a

short line, has been authorized by the I. C. C. to construct 59 miles of road from Hooker to Keyes. It is thought the company may continue the line to Des Moines, N. M. later.

PERSIA.—The Persian Government has awarded a contract for the 1600-kilometer Persian Gulf-Caspian Sea railroad to Ulen & Co., New York, and two firms of Berlin, Germany.

TEXAS.—The Rock Island will start work soon on the second section of its new line between Amarillo and Liberal, Kan. This section is between Stinnett and Gruver, 35 miles. It is expected the road will be finished from Amarillo to Gruver in time to handle this fall's wheat crop of the northern Panhandle.

The Santa Fe is said to be considering construction of a 60-mile branch to run from Hale Center to Parmerton.

The Kansas City, Mexico & Orient plans to complete the 120-mile line between San Angelo and Del Rio, which will form a through route into Mexico when the National of Mexico constructs its line from San Carlos to Villa Acuna.

WEST VIRGINIA.—I. C. C. examiners recommend that the Virginian & Western be permitted to build a line from a connection with the Guyandot River branch of the Virginian at or near Itmann, down the Guyandot River to a connection with the Chesapeake & Ohio at or near Gilbert, 40 miles; that the Guyandot & Tug River, a subsidiary of the Norfolk & Western, be permitted to build a line from Gilbert to Wharncliffe instead of the 53-mile line from Elmore to Wharncliffe they had requested, and that the Chesapeake & Ohio be denied permission to build a line from Gilbert to Mullens, 74.3 miles.

Buildings & Structures

ARKANSAS.—Little Rock. The Missouri Pacific has awarded a contract to the Missouri Valley Bridge & Iron Co., Leavenworth, Kan., for the substructure of the Baring Cross bridge over the Arkansas River, to cost about $275,000.

CALIFORNIA.—San Francisco. The Southern Pacific is considering construction of a bridge over Carquinez Straits to replace train ferries, it is said. Investment is estimated at $15,000,000.

ILLINOIS.—Chicago. The C. B. & Q. has awarded a contract to the Roberts & Schaefer Co., Chicago, for a 400-ton capacity, 4-track simplex automatic electric, fireproof locomotive coaling plant for their Western avenue terminal.

—Galesburg. The Santa Fe is requesting bids for a coaling station here.

INDIANA.—Fort Wayne. The Pennsylvania, the Wabash and four produce companies have plans to construct a union produce terminal to cost about $350,000, and to consist of four two-story buildings, each of which will contain a refrigeration unit and will be provided with trackage facilities and platforms.

KENTUCKY.—Louisville. The Cleveland, Cincinnati, Chicago & St. Louis has let a contract to the McClintic-Marshall Co., Pittsburgh, for the reconstruction of a bridge superstructure.

MEXICO.—Villa Acuna. See Del Rio, Texas.

MINNESOTA.—Albert Lea. The Minneapolis & St. Louis plans a reinforced concrete viaduct at Broadway to cost $200,000, it is reported. The cost will be shared by the state highway commission.

NEW YORK.—New York City. The New York Central has let a contract to James Stewart & Co., Inc., New York, for roadways over the 45th street viaduct and along the westerly side of the Grand Central terminal.

OHIO.—Cincinnati. Railroads entering here have permission from the I. C. C. to organize a union terminal company and erect a union passenger station, to cost approximately $31,500,000. Those concerned are the Chesapeake & Ohio, New York Central, B. & O., Louisville & Nashville, Southern, Pennsylvania and Norfolk & Western.

—Newark. The B. & O. has let a contract to the Hawkins Construction Co., Newark, for a freight house and facilities to cost about $100,000.

—Toledo. The New York Central and city officials have agreed to eliminate the Central avenue grade crossing by elevating tracks and constructing a steel and concrete structure to span the highway and sidewalks.

—Toledo. The B. & O. is planning a coaling station to have a capacity for 150 tons of sand and 300 tons of coal.

PENNSYLVANIA.—Philadelphia. The Pennsylvania has awarded a contract to the T. J. Foley Co., Pittsburgh, for masonry on a span at the north end of the Manayunk bridge over the Schuylkill River.

—Stony Brook. The Pennsylvania will build an overhead bridge to eliminate a grade crossing, to cost $42,000. The contract was awarded to the T. J. Foley Co., Pittsburgh.

PENNSYLVANIA.—Bird-in-Hand. A contract has been awarded the T. J. Foley Co., Pittsburgh, by the Pennsylvania for masonry and excavation work for an undergrade bridge to cost about $45,000.

—Brownsville. A five-story passenger station will be built for the Monogahela by the H. K. Ferguson Co. at an estimated cost of $350,000. This will be third of a group built by Ferguson engineers for the Monogahela here, the others being a freight station and a locomotive repair shop erected last year.

TEXAS.—Amarillo. The Panhandle & Santa Fe plans a 90 by 140-ft., 12-story concrete, brick and steel office building, it is reported.

—Del Rio. The Kansas City, Mexico & Orient has asked the Mexican government for permission to construct a bridge over the Rio Grande River between here and Villa Acuna, Coah.

—Houston. The Galveston, Houston & Henderson has asked the director of the port for permission to reconstruct its bridge over Buffalo Bayou at Allen street.

—Waxahachie. A concrete, 180-ft. viaduct is to be built over the tracks of the M.-K.-T. and the Waxahachie Creek by Ellis county. Of the $123,000 total cost the railroad will be asked to pay $23,000.

UTAH.—Cisco. The D. & R. G. W. is planning a plant to treat 15,000 gal. of water an hour. Other plants being planned by this company are Helper, 30,000 gal.; Farnham, 15,000 gal.; Westwater, 15,000 gal., and Greenriver, 30,000 gal.

WASHINGTON—Yakima. The Northern Pacific has let a contract to E. J. Dunnigan, St. Paul, for a 4-track concrete bridge over Walnut street. The estimated cost is $250,000.

WISCONSIN.—Appleton. The Chicago & North Western has let a contract to E. A. Johnson, Chicago, for a freight station to cost about $55,000.

—Carrollville. The Chicago & North Western has let a contract to Henry Danischefsky for a concrete block and tile passenger and freight station to be 22 by 88 ft.

—Green Bay. The Green Bay & Western let a contract to the Zenith Dredge & Dock Co., Duluth, for a 40 by 600-ft. frame and pile dock, to cost about $150,000.

WYOMING.—Cheyenne. The Union Pacific is reported considering a viaduct over its tracks at Central avenue, to cost about $400,000.

—Laramie. The Union Pacific is said to be planning a viaduct over its tracks at Grand avenue and Fremont street.

Locomotive Orders

The Class 1 railroads in the first two months of this year, installed 325 locomotives. Compared with the corresponding period last year, this was an increase of 20 locomotives but a decrease of 41 compared with the corresponding period in 1926. Locomotives on order March 1 totaled 171 compared with 276 on the same date last year.

Locomotives in need of repair March 15 totaled 9,294 or 15.4 per cent of the

THE PENNSYLVANIA RAILROAD

SUMMARY OF ANNUAL REPORT FOR 1927

THE 81ST ANNUAL REPORT of The Pennsylvania Railroad Company, covering operations for the year 1927 will be formally presented to the stockholders at the annual meeting on April 10, 1928. The report shows that although the Company in 1927 suffered a loss of almost $45,000,000 in railway operating revenues, it actually earned net income exceeding that of 1926 by $592,337.

The net income for the year, amounting to $68,160,296, was equivalent to 13.6% upon the capital stock outstanding, as compared with 13.5% in 1926.

OPERATING RESULTS	1927	Comparison with 1926 Increase or Decrease
TOTAL OPERATING REVENUES amounted to	$664,851,023	D $44,966,426
TOTAL OPERATING EXPENSES amounted to	510,668,662	D 39,691,916
LEAVING NET REVENUE of	$154,182,361	D $5,274,510
TAXES amounted to	35,709,749	D 1,400,444
EQUIPMENT, JOINT FACILITY RENTS, etc. amounted to	14,495,309	D 1,418,612
LEAVING NET RAILWAY OPERATING INCOME of	$103,977,303	D $ 2,455,454
INCOME FROM INVESTMENTS AND OTHER SOURCES amounted to	43,236,996	I 3,346,960
MAKING GROSS INCOME of	$147,214,299	I $ 891,506
RENTAL PAID LEASED LINES, INTEREST ON FUNDED DEBT AND OTHER CHARGES amounted to	79,054,003	I 299,168
LEAVING NET INCOME (Equal to 13.6% on Capital Stock) of	$ 68,160,296	I $ 592,337

After providing for the payment of 7% dividends to the stockholders and also providing for sinking and other reserve funds the Company earned a SURPLUS for the year of $28,046,355, equivalent to more than 5½% on the capital stock.

The successful achievement in financial results of the past year, in spite of the reduced volume of business, was made possible by large capital expenditures to improve and expand the railroad's plant and facilities; by operating economies and efficiency, and by increased vigilance and cooperation on the part of officers and employes. Not the least satisfactory feature of the year's experience was the cordiality of relationship between the Management and employes.

W. W. ATTERBURY
President

Philadelphia, Pa., April 2nd, 1928.

THE PENNSYLVANIA RAILROAD

Carries More Passengers, Hauls More Freight
Than Any Other Railroad in America

SHIP AND TRAVEL VIA PENNSYLVANIA

Stockholders may obtain copies of the Annual Report from Lewis Neilson, Secretary, Broad Street Station, Philadelphia, Pa.

number on line, 8.6 per cent in need of classified repairs and 6.8 per cent in need of running repairs. This was an increase of 437 compared with the number on March 1. Serviceable locomotives in storage on March 15 totaled 6,955 compared with 7,180 on March 1.

The Soo Line is contemplating buying eight Mountain type; the Chicago, West Pullman & Southern is enquiring for one switcher, and the Texas & Pacific, 15 2-10-4 type and five Mountain type. Orders placed with Lima since our last issue include those of the Southern Railway for 10 locomotives, Akron, Canton & Youngstown, two Mikados, and the Santa Fe, 15 tenders; with Baldwin, Illinois Terminal Co., one Mogul, Michigan & Limestone Chemical Co., two switchers, City of Seattle, one Prairie, the Uintah Railway, one (2-6-6-2) Mallet; with American (Montreal works), Dominion Coal Co., one Mogul and one Mikado.

Passenger Car Orders

The outstanding enquiry of the month is that of the New York Central for 19 coaches, three passenger and baggage cars, six dining cars, 30 baggage cars, 19 horse cars, 30 milk cars, two baggage and mail cars, and 10 motor car bodies, for service on various lines. The Detroit, Toledo & Ironton is enquiring for two combination baggage and mail cars and two passenger cars; the American Potash & Chemical Co., one passenger and baggage car; the Illinois Central, 10 motor cars and 10 trailers; the Chicago Rapid Transit Co., 150 motor cars and 150 double-end trailers; the Chicago, Aurora & Elgin, 10 interurban cars and the Chicago, South Shore & South Bend, 10 interurban cars.

Orders placed during the month include those of the Canadian National for five cafe parlor cars, two buffet club cars and 30 colonist cars with the Canadian Car & Foundry Co., and 12 baggage and 20 colonist cars with the National Steel Car Co.; the Frisco, five gas electric mail and baggage cars, with the Electric-Motive Co., and the St. Louis Car Co.; the Union Pacific four rail motor cars with the Electro-Motive Co., and the Pullman Car & Mfg. Corpn.; and the Chicago & North Western, five rail motor cars with the Electro-Motive Co., and the Pullman Car & Mfg. Corpn.

Freight Car Orders

According to the car service division of the A. R. A. freight cars installed in service in the first two months in 1928 totaled 6,032 compared with 10,621 for the same period in 1927 and 12,817 for the same period in 1926. The railroads had 21,726 freight cars on order March 1 compared with 29,395 on the same date last year and 50,947 on the same date in 1926.

The outstanding order placed since our last issue is that of the Milwaukee for 1250 box cars from the Bettendorf Co., 500 box cars from the Pressed Steel Car Co., 500 box cars from the General American Tank Car Corpn., 250 box cars from the Pacific Car & Foundry Co., 300 automobile cars from the American Car & Foundry Co., 500 single deck stock cars from the Ryan Car Co., 150 double deck stock cars from the Siems-Stembel Co., 500 hopper cars from the Standard Steel Car Co., 500 hopper cars from the Pullman Car & Mfg. Corpn., and 200 ore cars from the Pressed Steel Car Co. The Canadian National has ordered 60 ballast cars from the Canadian Car & Foundry Co., and 200 ballast cars from the Eastern Car Co.; the North American Car Corpn., 300 refrigerator cars from the Pressed Steel Car Co.; the Safety Car Heating & Lighting Co., 30 special refrigerator cars from the American Car & Foundry Co.; the Protane Corpn., three tank cars from the General American Tank Car Corpn.; the Aluminum Co. of America, one 8,000-gal. experimental tank car from the Standard Tank Car Co.; Pond Creek Colleries, 60 mine cars from the Hockensmith Wheel & Mine Car Co.; the Pittsburgh Steel Co., three cars for plant service from the Pressed Steel Car Co.; the Pacific Fruit Express, 600 cars from the American Car & Foundry Co. The Northern Pacific has ordered 50 caboose underframes from the Pacific Car & Foundry Co., and the Chicago & Northwestern, 1000 automobile car bodies divided between the Standard Steel Car Co., and the General American Car Co. The Norfolk & Western will rebuild 250 all steel gondola cars at its Roanoke shops.

According to an unconfirmed rumor the Pennsylvania will enter the market for 10,000 to 12,000 freight cars. The Atlantic Coast Line is enquiring for 300 freight cars and 200 phosphate cars; the North American Car Corpn., for 500 tank cars; the Pere Marquette for 20 steel air dump cars; the Seaboard Air Line for 500 underframes; the Southern Pacific for 250 automobile cars, 175 tank cars, 10 dump cars, 500 flat cars and 50 gondola cars; the Cudahy Packing Co., for 100 underframes; the Chinese Eastern Railway Commission for 990 closed goods wagons and the Egyptian State Railways for 320 low side wagons.

Bus and Truck Orders

Among the recent bus orders and enquiries are the following: Reading Transportation Co., 10 club coaches to be built according to the design of the carrier, by the Mack International Motor Co.; Boston, Revere Beach & Lynn, two 23-passenger A. C. F. urban coaches; New England Transportation Co., 15 A. C. F. parlor observation coaches; Winnipeg Electric Co., three Twin Coach city type; San Diego Electric Railway Co., one Twin Coach city type; Northern Ohio Power & Light Co., Akron, 11 Twin Coach city type and 6 Twin Coach parlor coaches; Hazelton Autobus Co., one Mack 25-passenger city type; Illinois Power & Light Corpn., one Mack 29-passenger parlor car; Houston Electric Co., four Twin Coach city type; Fitchburg & Leominster Street Railway, five Studebaker 21-passenger city type. It is understood an order will be placed by the Newburgh Public Service Corpn., to replace 20 buses destroyed by fire on March 30.

SPECIALISTS IN FORGED

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Draw Bar Yokes
Knuckle Pins
Air Brake Pins
Brake Jaws
Journal Box Wedges
and
Miscellaneous Forgings

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PITTSBURGH, PA.

San Francisco, Rialto Building — Minneapolis, Sexton Bldg. — Richmond, Va., Travelers Bldg.
Chicago, 557 Ry. Ex. Bldg. — New York, 52 Vanderbilt Ave. — Boston, 683 Atlantic Ave.

Changes in Personnel

Executive and Operating

Hugh Neill, vice president of the Southern Pacific, has been elected a director to succeed Henry E. Huntington, deceased.

C. M. Sheaffer, assistant vice president in charge of operation of the Pennsylvania, retired April 1 after 51 years of service.

W. P. Stiles has been appointed superintendent of dining cars, hotels and restaurants of the Western Pacific, with offices at Oakland, Calif., to succeed **C. E. Benton,** resigned.

Clarence G. Bowker, vice president of the Detroit Terminal, has been elected president to succeed **E. D. Bronner,** vice president of the Michigan Central. Mr. Bowker is also general manager of the Grand Trunk Western, with headquarters at Detroit.

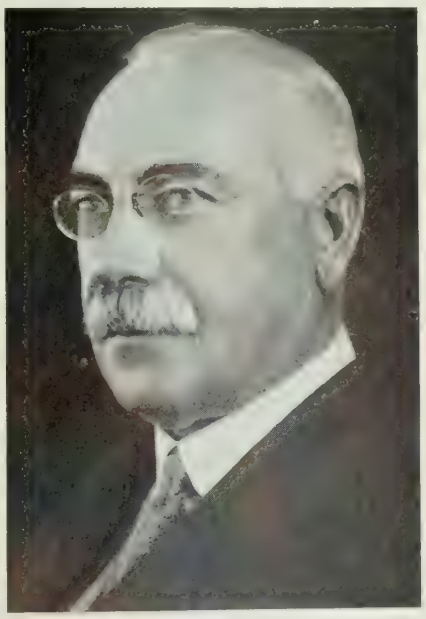
G. R. Whisler, superintendent of the Jacksonville & Havana, with headquarters at Jacksonville, Ill., has been named superintendent of the Chicago, Springfield & St. Louis, with headquarters at Springfield. **B. O. Scott** will succeed Mr. Whisler as superintendent of the Jacksonville & Havana.

Homer Loring, chairman of the executive committee of the Boston & Maine, has resigned and will be succeeded by **Thomas Nelson Perkins,** a member of the board of directors.

Robert T. Rossell, vice president of the Bessemer & Lake Erie and the Union Railroad, has been elected president with headquarters at Pittsburgh, to succeed **James H. Reed,** deceased.

The Pennsylvania has announced the following changes: **F. H. Krick,** assistant train master, Columbus division, has been appointed train master, vice **J. A. McClintock,** who has been appointed freight train master, Panhandle division, central region. **W. P. Hallstein,** supervisor of telegraph and signals, Ft. Wayne division, has been transferred to the Indianapolis division, vice **O. E. Rice,** transferred to supervisor of telegraph and signals, Logansport division; **A. M. Crawford,** supervisor of telegraph and signals, Monongahela division, has been transferred to the Ft. Wayne division to succeed Mr. Hallstein. **C. E. O'Brien,** general foreman, telegraph and signals department, Columbus division, has been appointed assistant supervisor of telegraph and signals of that division vice **C. L. Correy,** transferred to the same position, Panhandle division, central region. **F. I. Hale,** material supervisor, Richmond division, has been promoted to supervisor on that division, vice **J. F. McKinney,** transferred to the same position on the Indianapolis division.

William N. Neff has been appointed general superintendent, in charge of operation, and maintenance of way and structures, of the Northwestern Pacific, with headquarters at Sausalito, Cal.



Sir William Hoy

Sir William Hoy has resigned as general manager of the South African railways and harbors, with headquarters at Johannesburg, and will be succeeded by **J. R. Moore,** now assistant general manager of railways at Durban.

Robert S. Henry, director of public relations of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, has been named assistant to the vice president with jurisdiction over industrial and agricultural development work and public relations.

J. W. Walker, superintendent of the valley division, Santa Fe System, has been appointed assistant to general manager, and will be succeeded as superintendent by **C. G. Fluhr,** superintendent of the Arizona division. Mr. Fluhr will be succeeded by **G. W. Simpson.**

The Canadian Pacific has made the following changes: **A. A. Dunphy,** assistant superintendent on the Medicine Hat division, Alberta district, headquarters at Drumheller, Alta., has been transferred to the Calgary terminal. Mr. Dunphy succeeds **W. Thomas,** transferred to assistant superintendent at Drumheller. **W. Manson,** assistant superintendent on the Regina division, Saskatchewan district, headquarters at Weyburn, has been transferred to the Lethbridge division, Alberta district, headquarters at Lethbridge. Mr. Manson succeeds **C. C. Stibbard,** transferred to the Regina division.

J. T. L. Brooks has been named acting trainmaster of the Council Grove and Salina districts, central Kansas division of the Missouri Pacific, with headquarters at Council Grove. Mr. Brooks succeeds **G. R. Mabie,** who was injured recently.

The Pittsburgh, Shawmut & Northern has appointed **J. D. Beaver** general superintendent with headquarters at St. Marys, Pa., to succeed **B. C. Mulhern,** deceased. **A. G. Geuder,** formerly assistant to the general superintendent at St. Marys, has been appointed assistant general superintendent.

L. A. Beck, tie and timber agent of the Norfolk Southern has been appointed assistant to the president with headquarters at Norfolk. The positions of vice president and general manager and tie and timber agent have been abolished.

B. C. Murphy, acting trainmaster on the Paragould district of the Missouri Pacific, has been appointed trainmaster on all districts of the Louisiana division, with headquarters at Monroe, La., to succeed **H. P. Stark,** resigned.

The Chicago, Springfield & St. Louis, announces that **H. J. Hadden,** purchasing agent, with headquarters at Springfield, Ill., has been appointed assistant to the general manager of that road and of the Jacksonville & Havana.

C. P. Dugan, superintendent of transportation of the Norfolk Southern, with headquarters at Norfolk, Va., has been appointed general superintendent, steam lines. The position of superintendent of transportation has been abolished.

The Denver & Rio Grande Western announces: **L. W. Bowen,** superintendent of the Salida division with headquarters at Salida has been transferred to the Pueblo division with headquarters at Pueblo to succeed **William N. Neff,** resigned; **W. R. McPherson,** trainmaster at Salt Lake City, will succeed Mr. Bowen at Salida; **E. W. Deuel,** assistant superintendent at Alamosa will succeed Mr. McPherson at Salt Lake City; **A. J. Broderick,** trainmaster at Grand Junction will succeed Mr. Deuel

at Alamosa, and **Walter Allen,** chief dispatcher at Salt Lake City will succeed Mr. Broderick as trainmaster at Grand Junction.

The Santa Fe announces that **H. R. McKee,** assistant superintendent of the Panhandle division, with headquarters at Wellington, Kans., has been promoted to superintendent of the Arkansas River division with headquarters at La Junta, Colo., to succeed **D. W. Orr.**

J. M. Perkins has been elected vice president of the Frankfort & Cincinnati, with headquarters at Frankfort, Ky.

Alfred O. Herman, chief clerk to the general manager of eastern lines of the Baltimore & Ohio, has been appointed assistant to the general manager, east-

Horace A. Clifford

ern lines, with headquarters at Baltimore.

H. F. Mathews, general superintendent of the sleeping and dining car and news service of the Canadian Pacific, has been appointed general manager of hotels, for the western lines with headquarters at Winnipeg. Mr. Mathews will be succeeded by **S. Wertheim,** now superintendent of that department.

Financial and Legal

The Missouri Pacific announces that **J. W. Seaman** has been elected secretary, treasurer and auditor of the San Antonio, Uvalde & Gulf, with headquarters at San Antonio. **H. V. Cooper** has been appointed superintendent of freight loss and damage claims of subsidaries of the Missouri Pacific, with headquarters at Palestine, Tex.

C. E. Eberle has been appointed secretary of the Gulf & Sabine River with headquarters at St. Louis, in addition to his duties as general auditor.

F. A. Reid has been appointed assistant treasurer of the Chicago, Springfield & St. Louis in addition to general freight and passenger agent. His headquarters is at Springfield, Ill.

Arthur E. Simon, chief assistant United States attorney at Seattle, has been appointed assistant western counsel of the Northern Pacific.

C. N. Marland, assistant treasurer of the Boston & Maine, has been appointed treasurer, succeeding **H. R. Wheeler,** deceased. **E. J. Gallagher,** assistant to the vice president, with headquarters at Boston, has been appointed assistant treasurer to succeed Mr. Marland. Mr. Gallagher will continue as assistant to the vice president in charge of finance.

Lucian H. Cocke, Jr., assistant general attorney for the Norfolk & Western with headquarters at Roanoke, has been appointed general attorney, to succeed his father, **Lucian H. Cocke, Sr.,** deceased.

Phineas B. Lacy, assistant treasurer of the Northern Pacific, headquarters at St. Paul, has been appointed treasurer to succeed **Horace A. Clifford,** retired.

Purchases and Stores

Robert J. Elliott, director of purchases of the Northern Pacific, has retired and the position has been abolished. **C. C. Kyle,** purchasing agent, will have charge of the purchasing and stores department.

C. H. Dyson, assistant fuel agent of the Baltimore & Ohio, with headquarters at Cincinnati, has been appointed fuel agent with headquarters at Baltimore, to succeed **E. A. Foos,** deceased.

Traffic

C. O. Williams, assistant general passenger agent of the Kansas City Southern, with headquarters at Kansas City, has been appointed general passenger and ticket agent there succeeding Samuel **G. Warner,** retired.

Robert Thomson, assistant general passenger agent of the Chicago & North Western, with headquarters at Chicago, has been promoted to assistant passenger traffic manager.

George H. MacRae, general passenger agent of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, has retired and will be succeeded by **Edward L. Pardee,** now general passenger agent at St. Paul. **Forrest A. Brown,** general agent in the passenger department at Minneapolis, will succeed Mr. Pardee. **W. L. Mansfield,** general agent in the passenger department at St. Paul, has been promoted to assistant passenger agent, with headquarters at the same point.

The Long Island has abolished the office of superintendent of station service, held by **R. W. Farrell,** who has been appointed general baggage agent.

The Chicago, Springfield & St. Louis has appointed **J. T. Kingsley** general agent with headquarters at Pittsburgh.

Frank H. Hocken, district freight and passenger agent for the Union Pacific at Spokane, has been appointed general agent for the Western Pacific at Salt Lake City, to succeed **G. I. Martin,** who has been transferred to Reno to serve as general agent for the Western Pacific and the D. & R. G. W.

The Wabash announces that **F. I. McNally,** division passenger agent, has been promoted to assistant general pas-

Phineas B. Lacy

senger agent with headquarters at the same point.

C. H. Garn, city passenger agent of the New York, Chicago & St. Louis at Ft. Wayne, has been appointed general agent in the passenger department at St. Louis.

The Baltimore & Ohio announces that **A. F. Roloson** will succeed **Harry Atkinson** as foreign freight agent, with headquarters at Chicago.

R. J. Tyner, chief clerk to the general freight agent at Dallas of the Katy, has been appointed general agent of the Toledo, Peoria & Western, with headquarters at the same point.

The Erie announces that **E. J. Hawerkost,** city passenger agent at Chicago, has been appointed general western passenger agent.

J. M. Ballingall, assistant to the general freight agent of the Spokane, Portland & Seattle at Portland, Ore., has been promoted to assistant general freight agent.

H. C. Baird has been appointed assistant general freight and passenger agent of the Oklahoma City-Ada-Atoka, with headquarters at Oklahoma City.

Mechanical

W. Y. Cherry, superintendent of motive power, lake division, of the Pennsylvania, with headquarters at Cleveland, has been appointed superintendent of motive power of the Long Island, with headquarters at Richmond Hill, N. Y. Mr. Cherry will be succeeded by **R. W. Wray,** master mechanic on the Pennsylvania at West Philadelphia. **H. J. W. Kleine** has been appointed assistant master mechanic of the Pittsburgh division, with headquarters at Conemaugh, Pa.

The Long Island has appointed **J. D. Cousins** road foreman of engines with headquarters at Jamaica, succeeding **J. B. Ward,** retired.

T. J. Cutler, mechanical superintendent of the Northern Pacific, with headquarters at St. Paul, has retired because of ill health and will be succeeded by **B. P. Johnson,** general master mechanic at Livingston, Mont. **G. F. Egbers,** master mechanic at Spokane, will be transferred to Livingston to succeed Mr. Johnson. **R. P. Blake,** who was master mechanic at the Mississippi street shops in St. Paul during the leave of absence of **J. B. Neish,** will succeed Mr. Egbers at Spokane. Mr. Neish will resume his duties in St. Paul.

Civil

Henry Espeland has been appointed bridge and building supervisor of the Northern Pacific at Pasco vice **E. M. Hull,** resigned.

C. H. Griggs, division engineer of the Buffalo, Rochester & Pittsburgh, with headquarters at East Salamanca, N. Y., has been transferred to superintendent of the timber preserving plant, with headquarters at Bradford, Pa. Mr. Griggs will be succeeded at East Salamanca by **H. B. Hoyt,** superintendent of the timber preserving plant at Bradford.

J. E. Fletcher, track supervisor of the Erie, has been appointed assistant engineer, maintenance of way department, with headquarters at Huntington, Ind.

Asa Hall Morrill, engineer of construction of the Maine Central has been appointed chief engineer with others at Portland, to succeed **Bertrand T. Wheeler,** deceased. **Clinton A. Plumly,** valuation engineer, has been appointed assistant to the chief engineer, with headquarters at Portland. The office of valuation engineer has been abolished.

Obituary

Bernard C. Mulhern, general superintendent of the Pittsburgh, Shawmut & Northern, died in Buffalo, N. Y., March 15.

Walter B. Leach, president and general manager of the Hunt-Spiller Mfg. Corp'n., Boston, died March 13, at his home in Brookline, Mass.

Bruce P. Owens, vice president of the **Central Valve Manufacturing Co.,** died March 30, at Wilmette, Ill. This company was formerly the **O'Malley-Beare Valve Corpn.**

Bertrand Thorp Wheeler, chief engineer of the Maine Central since 1912, died March 20.

J. H. McConnell, one of the designers and developers of the Pacific type locomotive, and for 33 years with the Union Pacific, died April 4, at Santa Barbara, aged 85.

Mr. McConnell was born in Elmira N. Y., in 1843. He became superintendent of motive power of the Union Pacific, with headquarters at Omaha, in 1868. In 1901 he retired to become manager of the Pittsburgh branch of the American Locomotive Works, where he remained for five years. During this time he was instrumental in the development of passenger and freight locomotives. Mr. McConnell's father, in 1839, was engineer on the fourth locomotive ever operated in this country.

Supply Trade Notes

A. L. Whipple, representative of the **Locomotive Stoker Co.,** has been appointed district sales manager for the **Standard Stoker Co., Inc.,** with headquarters at New York City.

W. S. Carson, formerly representative of **Joseph T. Ryerson & Son, Inc.,** will be in charge of the district sales office of the **Globe Steel Tubes Co.,** Milwaukee, recently opened in Cleveland.

Carl F. Gehlen, formerly with **E. I. DuPont de Nemours & Co., Inc.,** but for the last year with **L. O. Cameron,** has returned to the former company as assistant to manager, railway sales de-

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partment, with headquarters at Parlin, N. J. **Roy A. Phelps,** formerly assistant to manager, has been named district manager with headquarters at Parlin.

John G. Platt, vice president of the **Hunt-Spiller Mfg. Corpn.,** Boston, has been elected president and general manager, following the death of Walter B. Leach. Mr. Platt entered the service of this corporation in 1907 as mechanical representative. In 1912 he was appointed sales manager and in 1917 vice president. He was born at Zanesville, O., February 11, 1874, but when he was five years old his parents moved to Baltimore, where he attended the public schools. While still young he became a messenger for the B. & O., at 16 he became an apprentice in the locomotive department. At 20 he became a locomotive draftsman. In 1901 he was named chief draftsman of the western lines, but resigned in 1902 to become assistant to the master mechanic of the Erie.

In 1907 Mr. Platt resigned from the Erie to serve as master mechanic of the American Steel Foundry, Franklin branch, from February to June, when he entered the service of the Hunt-Spiller Mfg. Corpn.

Victor W. Ellet, sales manager, has been elected vice president of the Hunt-Spiller Mfg. Corpn., to succeed Mr. Platt, and **E. J. Fuller,** assistant sales manager, will succeed Mr. Ellet as sales manager.

The **Standard Underground Cable Co.,** Pittsburgh, has appointed **Harold P. Childs** general sales manager to succeed **A. B. Saurman,** who has been appointed vice president and consulting general sales manager. Mr. Childs resigned as vice president in charge of sales and advertising of the **Servel Corporation.**

Paul Willis has resigned as district manager of the **Franklin Railway Supply Co., Inc.** and has been elected a vice president of the **J. S. Coffin, Jr. Co.,** Jersey City.

C. E. Preble, who has been in charge of the engineering department of the **Heywood-Wakefield Co.,** Wakefield, Mass., has been appointed assistant in the railway sales department, New York.

The **Carbic Mfg. Co.,** Duluth, has appointed the **Oxweld Acetylene Co.,** New York, exclusive distributor of the Carbic acetylene floodlight, the generator, and other acetylene equipment. The **Union Carbide Sales Co.,** New York, will be the exclusive distributor of processed carbide in cake form.

A. L. Roberts, formerly with the railroad sales department of the **Central Alloy Steel Corp.,** Massillon, Ohio, is now with the development and research department of the **International Nickel Co.,** New York.

Leeds, Tozzer & Co., Inc., New York, has been appointed distributor of Stueb-ing-Cowan hand and electric lift trucks, and Steel-Bound platforms.

L. W. Birch of the **Ohio Brass Co.,** Mansfield, has been made assistant manager of the railway sales division.

The **Anchor Co.,** Milwaukee, has appointed the **Hopkins-Benedict Co.,** Chicago, sales representative.

The **Truscon Steel Co.,** Youngstown, Ohio, announces the following changes: **C. I. Auten,** manager of the steel building department, has been elected vice president in charge of sales in the standard building division with jurisdiction over sales of structural steel, steel deck roofing and transmission structures; **M. T. Clark,** manager of the sash department, has been named vice president in charge of steel window sales, and **C. D. Loveland,** manager of the Pittsburgh district, has been elected vice president in charge of distribution in New Jersey with headquarters at Newark.

The **Pressed Steel Car Co.,** New York, announces that **F. O. Schramm,** assistant secretary, has been appointed also assistant general sales manager for the eastern territory, and **Frank L. Johnson,** sales engineer, has been appointed assistant general sales manager for the western territory, with headquarters at Chicago.

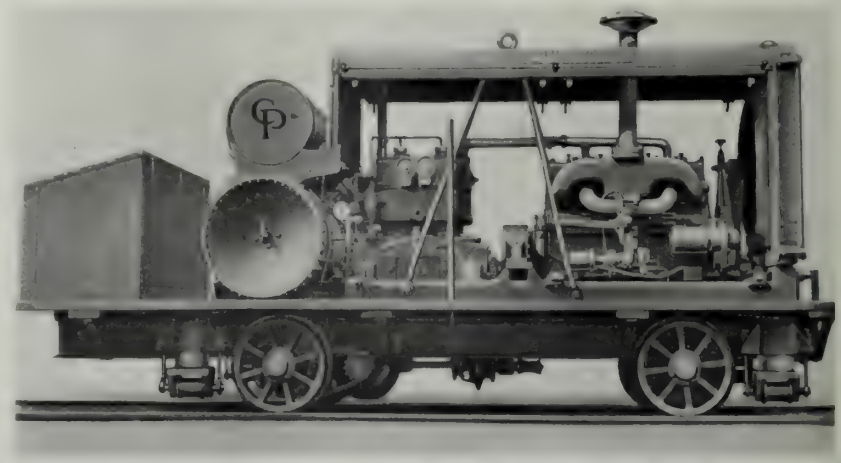
New Self-Propelled Compressors

A new line of self propelled gasoline engine driven compressor cars for railroad use has been announced by the Chicago Pneumatic Tool Co., New York City. The machines are built in sizes of 100, 160, 220, and 310 cu. ft. per minute displacement. They consist of the standard Chicago Pneumatic portable units set on a structural steel frame, mounted on flanged roller-bearing equipped wheels. Flanged transverse wheels, air operated lifting jacks, and a transverse towing winch make it possible for one man to shift the car from the main line tracks to a siding in less than one minute. Equipment includes locomotive lifting bale, large equipment box, wide platforms extending over the wheels on each side, and trailer type drum brakes fitted to the two front wheels. The self propelling mechanism embodies a two wheel drive which propels the car at a speed of 12 to 18 m.p.h.

The compressor unit embodies the same distinctive features as the company's industrial portable compressor, which features include an automatic air operated throttle which slows down the engine when the compressor unloads, sectionalized radiator protected by steel bars, detachable flexible coupling between the compressor and the engine, and a one-piece cast steel deck on which the compressor, engine and accessories are mounted.

U. P. to Spend 90 Millions

The Union Pacific System has set aside 90 million dollars for improvements and maintenance this year, C. R Gray, president, announces. The figure compares with 85 million dollars for the same purposes last year. Of the total $28,800,000 is for the maintenance of way and structures, $38,300,000 for maintenance of equipment and $23,000,000 for improvements and extensions involving expenditures. Among the larger items in the last named amount are $2,500,000 for a 54-mile extension in eastern Wyoming known as the North Platte cut-off, which joins the west end of the company's North Platte branch with its main line at Egbert; $675,000 for double tracking an additional ten miles of its line to the Northwest, between King Hill and Ticeska, Idaho; $5,000,000 for new equipment; $375,000 for enlarging for double tracking and lining tunnels on the Los Angeles line; $550,000 for completing a $2,500,000 improvement program at the Grand Canyon and in the Southern Utah parks region, and extensive allowances for grade separations, new and heavier rail and longer passing tracks at many points.



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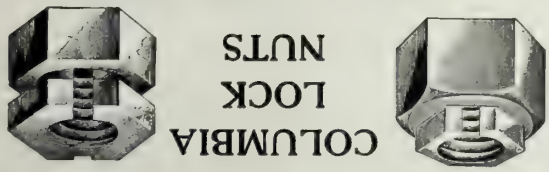

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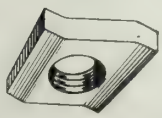

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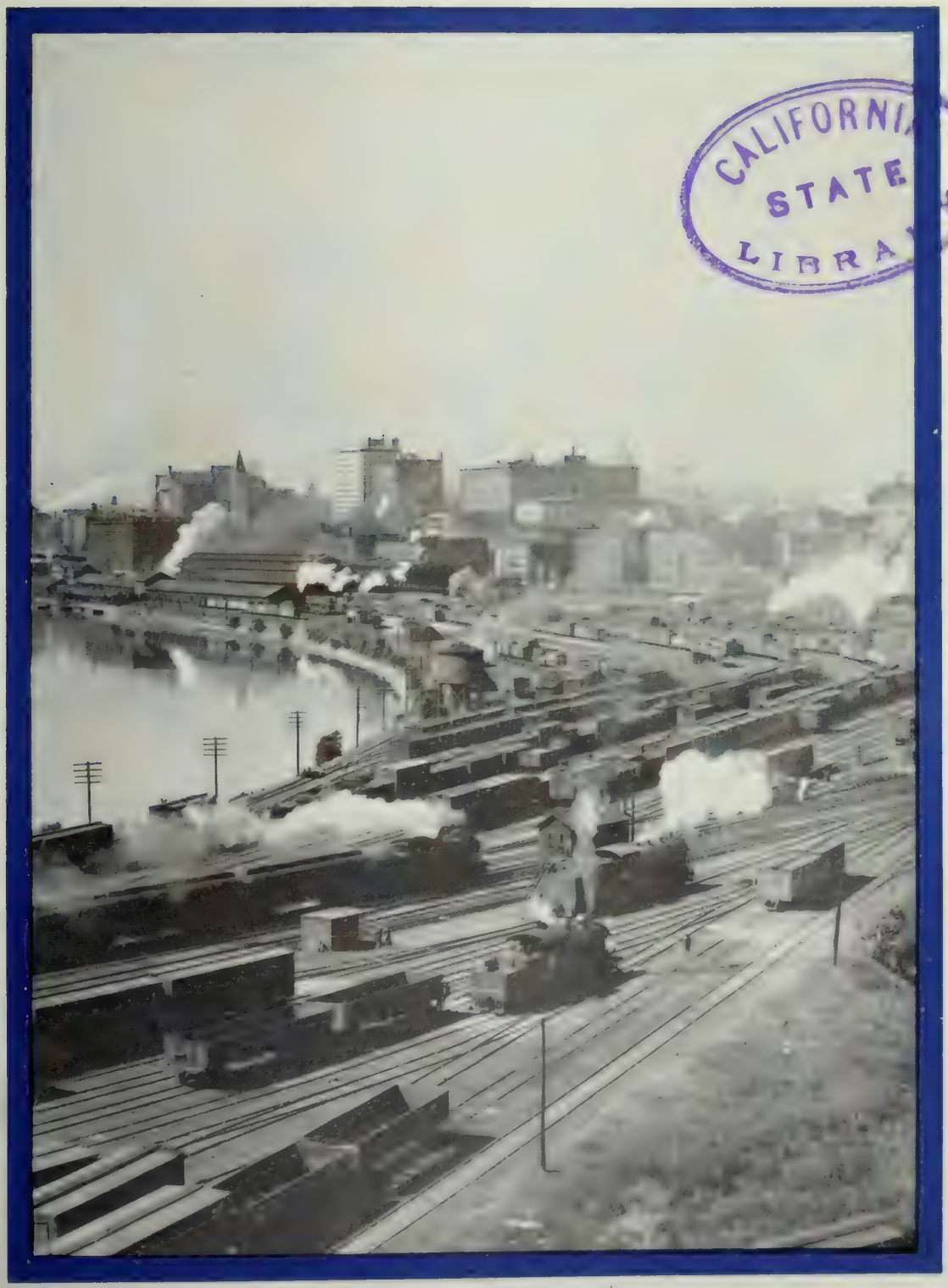
Transportation

The Monthly Magazine of the Transportation Industry



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Vol. II May, 1928 No. 5

ATLANTIC CITY JUNE CONVENTIONS

OF THE AMERICAN RAILWAY ASSOCIATION

JUNE 20-27
THE ANNUAL MEETINGS OF DIVISION V (MECHANICAL)

JUNE 20-22
THE ANNUAL MEETINGS OF DIVISION VI (PURCHASES AND STORES)

JUNE 21-23
MEETINGS OF THE NEW MOTOR TRANSPORT SECTION

JUNE 20-27
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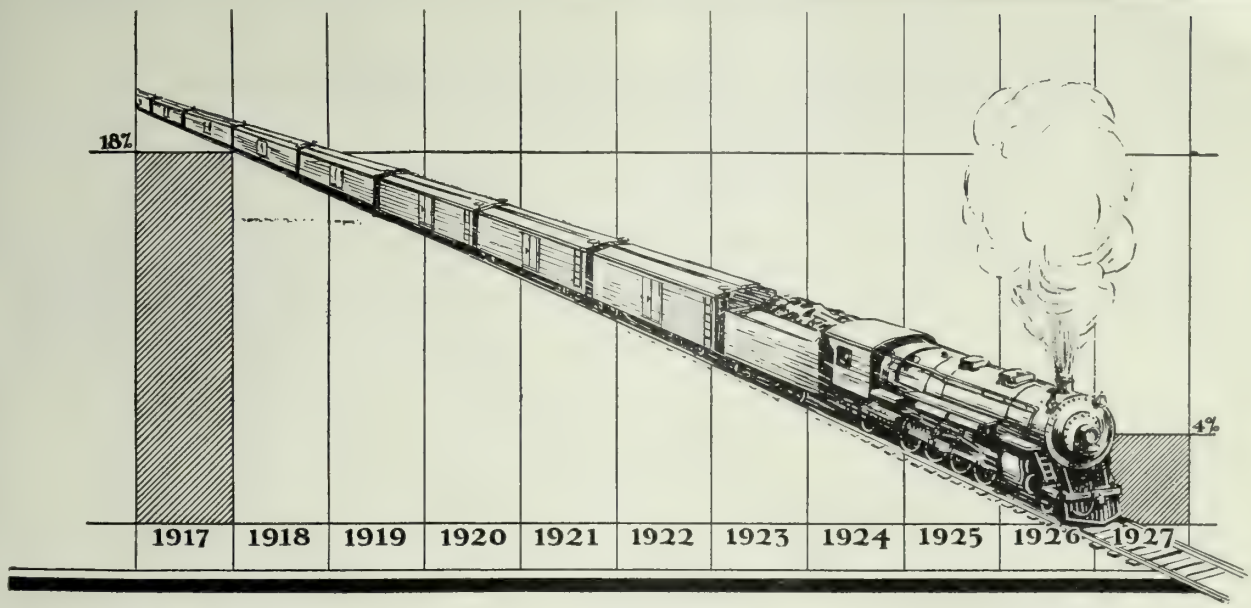

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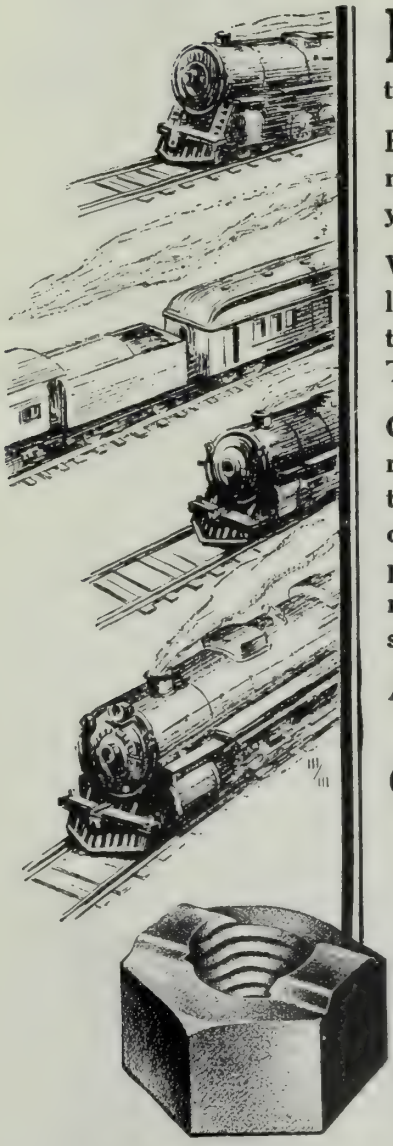
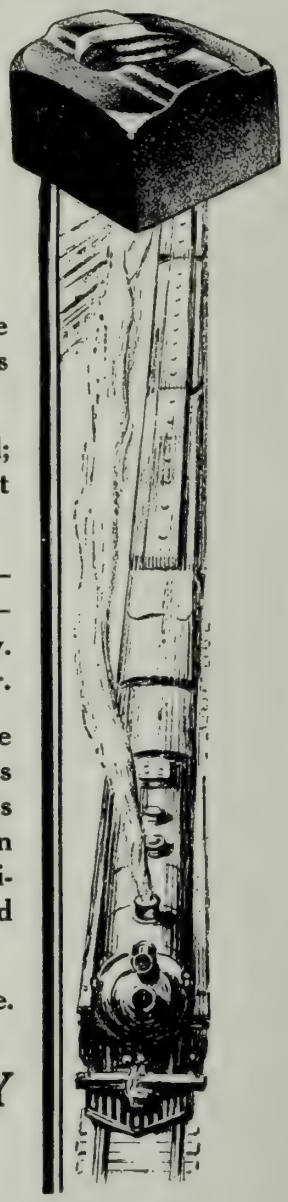
When Trains Move





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Transportation

The Monthly Magazine of the Transportation Industry

MAY, 1928

VOLUME TWO NUMBER FIVE

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Mercury *Trackless Train*

A Radio on Canadian National Trains

Keeping in Touch With Things

By Harvey Potter

JUST when it seems that everything imaginable has been provided for the comfort and even the luxury of the traveling public along comes the Canadian National Railways with continuous radio service as part of its standard equipment. All the transcontinental trains, and several of the other principal trains of these railways are equipped with radio receiving sets, headphones and loud speakers, and arrangements are being completed for adding similar equipment to all important trains of the system. In this way passengers on the long journey across the continent are kept in touch with the events of the day. World news and enjoyable concerts from many of the important cities in Canada and the United States are received daily through these instruments while the trains are in motion.

The Canadian National was the first, and still is the only railway system in the world to adopt radio as part of the regular service of transportation. A chain of broadcasting stations radiating information and entertainment north and south, east and west across the continent has been established with powerful links in Moncton, Quebec, Montreal, Ottawa, Toronto, Winnipeg, Regina, Saskatoon, Calgary, Edmonton and Vancouver. This radio service is the outgrowth of careful experimentation, much thought and a lot of hard work.

Radio experimentation on the Canadian National extends back to October, 1902, when Sir Ernest Rutherford, world famous expert of the atomic theory, then a professor at McGill University, Montreal, carried out successfully the transmission of signals by wireless to a moving train on the Grand Trunk System between Toronto and Montreal. The Grand Trunk System is now part of the Canadian National Railways. That was the first occasion on which signals had been transmitted successfully to a moving train.

It was early in the summer of 1923 that radio on the Canadian National Railway really came into being. A special party of influential citizens from New York and vicinity was on its way across Canada on a special train. It was decided as a novelty to broadcast to the members of the party a message of welcome to the dominion as the train left Montreal, and to tell them something of the scenic treats in store for them. The observation car of their train was fitted with a receiving set and W. D. Robb vice president of the Canadian National Railways, who is keenly interested from a scientific standpoint, delivered the address into the microphone. The experiment was successful beyond anticipations and in that moment the radio service of the Canadian National Railways was born.

Mr. Robb then organized a new department and developed the general policy. He gathered about him several capable engineers and the foundation was laid. The development then proceeded along two related plans, one for equipping trains, the other for organizing and establishing broadcasting stations. Radio receiving sets were placed on several trains as part of the standard equipment, and this was increased gradually until the entire transcontinental system embodied this equipment as a necessary standard.

A New Member of the Crew: The Radio Operator.

Difficulty was experienced at first in getting the types of sets necessary for successful reception of concerts on board a moving train, but this difficulty has been overcome, and today all of the 16 transcontinental trains needed for the eastward and westward daily movement of passengers between Montreal and Vancouver, have been equipped with receiving sets. The evening train operating between Montreal and Quebec has been equipped; "The Confederation" which operates between Toronto and Vancouver; "The International Limited." between Montreal and Chicago; "The Inter-City Limited" between

Showing How the Antenna is Constructed on the Parlor Cars.

Montreal and Toronto; "The Ocean Limited" between Montreal and Halifax; "The Acadian" between Montreal and Halifax, and parlor cars on the run from St. John to Halifax.

Eventually every important train on the system will have radio receiving sets. These are placed in the compartment-observation cars on the transcontinental route and on the parlor-library car of other trains. The cars are fitted with a number of individual headphones as well as loud speaker so that when it is not advisable to use the loud speaker, those desiring to listen may do so through the phones.

There was another important feature to be considered. All the various broadcasting stations used different letters, none of which had any relationship to the railway. It was discovered that Morocco was then using the call letters CNR and as these letters happened to be the initial letter of each of the words that make up the name of the Canadian National Railways, it was decided to ask Morocco to relinquish these call letters to the company. A number of difficulties were met and, for a time it was thought the plan would fail, but the cooperation of the federal government of Canada, the British foreign office and the French government proved successful, and the Canadian National Railways received permission to use the call letters CNR. To these was added another letter indicative of the location of the station, Montreal as CNRM; Ottawa CNRO; Winnipeg CNRW; Calgary CNRC and so forth. Difficulty arose in the case of Moncton where, had the same plan been carried out, the call letters would have clashed with Montreal. It was decided, therefore, to name the Moncton station CNRA, the "A" symbolizing the Atlantic region of the Canadian National Railways of which Moncton is the headquarters.

There is a definite policy behind all this of which music and entertainment form only a part. The big idea lies in the dissemination of information about Canada calculated to attract the attention of capital, of settlers and tourists. Every program includes a brief address written with this end in view. Officers of the radio department conservatively estimate the nightly audience at more than two million, and the traffic and colonization departments attest to the efficacy of radio in requests for further information as to holiday resorts and opportunities offered young men in Canada.

The radio department has cooperated in national welfare campaigns of various character. The radio also has a special value in the administration of the railroad. The system comprises more than 23,000 miles of operated track and touches every province, every capital and every important city and town. It will be readily conceived that some difficulties are experienced by those charged with the administration of the property in maintaining that personal touch with all officers and employes which is essential in assuring the success of the enterprise. It is beyond the ability of a human being to meet personally every member of such a far-flung organization whose members on occasion number more than 110,000. In surmounting this difficulty the radio has played its part. At regular intervals officers of the company, including the president and his executives, talk to officers and their employes from a broadcasting station. The result has been a strengthening of morale. the development of an intimacy between distant but co-related portions of the system, and a general improvement, in service, in every department throughout the Dominion of Canada.

It won't be long now. Soon it will be possible for every Pullman passenger to hop or climb into his more-or-less bed, clamp the phones to his eager ears, and drift blissfully off to Slumberland as he listens to his customary bedtime story just as if he were at home. Isn't it wonderful?

D L & W Electrification To Cost $18,000,000

When the patrons of a railroad declare themselves willing to submit to an increase of fares in order to make it possible for the company to provide facilities not justified by the present revenues the situation presented is not only

The Radio Operator Is a Neat Looking Chap.

extremely unusual, but the patrons are pretty likely to get just what they want. In proof of this confidence the Lackawanna Railroad is going to spend about $18,000,000 in electrifying the Morris & Essex line from Hoboken to Dover, the Passaic & Delaware to Gladstone, and the Montclair branch.

President J. M. Davis explains the unique arrangement in his announcement. A joint committee representing business and civic organizations of communities in a section of Northern New Jersey having a population of 1,250,000 had agreed to an increase in commutation fares in order to get the kind of transportation they believed they ought to have. Mr. Davis says:

"This matter of the electrification of the suburban lines of the Lackawanna has been the subject of much speculation and discussion on the part of patrons and communities for a long time; it also has been accorded consideration by our board but the present service is thoroughly dependable, operates with clock-like precision and at a cost so high that, considering the gradual loss of traffic to other forms of transportation that come and go, the increased cost of performing service and the everlasting pressure to reduce the rate on this or that between here and there, placed us in a position where we were unable to imagine an increase in traffic or a reduction in expense of sufficient proportions to enable the railroad to get its money back. Obviously, therefore, we have been rather cautious about incurring such a burdensome obligation. Now, however comes a committee composed of individuals representing all of the communities at interest urging the prompt undertaking of the electrification of the lines mentioned.

"This committee expressed the opinion that the importance of this project was so outstanding to their communities that those whom they represented would be willing to pay increased commutation fares in order to secure the advantages of such improvement in transportation facilities, and placed itself on record agreeing to cooperate with the railroad in securing an increase in commutation fares. Under such circumstances, our board has authorized our going ahead with the project.

Passengers May Use Head 'Phones When It Is Not Desired to Use the Loud Speaker.

"Some conception of the far-reaching significance of the change and what is involved can be gained when one contemplates that while the construction of many of the present suburban cars is such that they can be altered to fit the new operating conditions, about 100 of which are in splendid condition and servicable for a long time to come, will have to be replaced with others of special design; that about 75 perfectly good locomotives which are in splendid condition will have to be replaced, are not readily salable and, in all probability, will be reduced to mere scrap value; also that engine houses, coal handling plants, water stations, ash pits and other railroad paraphernalia almost without end and incident to steam operation will have to be dismantled."

The Lackawanna probably will use the direct-volt system of power transmission with overhead wires. The railroad owns both land and water rights along the Hackensack River and, of course, has ample quantities of excellent steam coal readily available to its lines. Officials of the company are carefully weighing the advantages and relative cost of purchasing electric power from outside companies as compared with the construction of a generating plant and manufacturing its own power. The construction and equipment of the proper power plant and accessories will cost about $4,250,000 and

will raise the total cost of this electrification work to about $18,000,000.

The work of construction will be handled by an electrical committee of the Lackawanna, appointed by President Davis, consisting of Vice President and General Manager E. M. Rine; Chief Engineer G. L. Ray; Electrical Engineer H. M. Warren; General Superintendent E. B. Moffatt; Superintendent of Motive Power and Equipment C. J. Scudder, and Superintendent R. M. White, with the advice and assistance of well known consulting engineers. Construction work will be started just as soon as the Lackawanna engineers can prepare plans. It is estimated the project will be completed within two years.

Many A Wrong Number, Too

"We have within our national boundaries only six per cent of the world's population but we have three-quarters of the world's telephone and telegraph equipment," according to R. H. Aishton, president of the American Railway Association.

"In the United States, there are now about 15 telephones for every 100 of our population. On June 30, 1927, there were 18,151,000 telephone stations compared with approximately 9,000,000 in 1922.

"Trains on nearly 60 per cent of the railroad mileage in this country are now operated by telephone. These figures show to what gigantic proportions and with what amazing speed the telegraph and telephone industry has developed in this country.

"This enormous growth has been largely brought about by intensive research and by the development of standards and specifications."

Telephone development throughout the world has had considerable impetus since the World War. Undoubtedly American telephone operations in the field, which amazed the allies, went a long way toward awakening Europe to communication possibilities. The Wall Street Journal, commenting on this development, says London's telephone service is as good as New York's which sounds like a pretty nasty crack.

The world's telephones today are distributed about as follows: North America 65.69 per cent, of which the United States has approximately 61 per cent; South America 1.45 per cent; Europe 26.92 per cent; Asia 3.27 per cent; Africa .61 per cent and Oceania 2.06 per cent.

There are approximately 29,000,000 telephones operated in the world today, of which about 18,500,000 are in the United United States. Of the world total approximately 9,000,000 are owned by governments and the balance privately owned. In North America less than 300,000 are government systems while in Europe out of some 7,000,000 telephones less than 1,000,000 are operated by private companies. The telephone systems of Austria, Belgium, France, Germany, Great Britain, Holland, Rumania, Sweden and Switzerland are entirely operated and owned by their respective governments.

There are approximately 100,000,000 miles of telephone wires in the world, of which approximately 63,000,000 are in North America and 61 per cent of that total in the United States. As of January 1, 1926 Germany had the second greatest mileage, with 8,603,015; Great Britain was next with 5,618,346 while Canada was fourth with 3,048,647 miles. In 1926 telephone development in leading cities of the world showed the following:

City	Telephones	Per 100 population
New York	1,415,108	24.0
Chicago	790,711	25.8
London	488,499	6.6
Berlin	415,871	10.3
Paris	255,561	8.5
Toronto	154,740	24.5
Copenhagen	121,286	16.1
Tokyo	121,856	5.9
Buenos Aires	104,281	4.5
Stockholm	107,173	28.1

San Francisco held first position in the proportion of telephones to population, with 31 per 100 and a total of 215,464 stations in 1926. Canton, China, was at the bottom of the list with 3,000 telephones and 0.3 stations per 100 population.

Traveling by air has disadvantages. There's no way you can attach a hot dog stand to a cloud.

Coffee Takes an Important Place in American Breakfasts, Especially on the Train. The Coffee Taster Shown Here Knows His Beans and Helps the Southern Pacific in Choosing the Right Kind.

Up the Years From Ox-Power

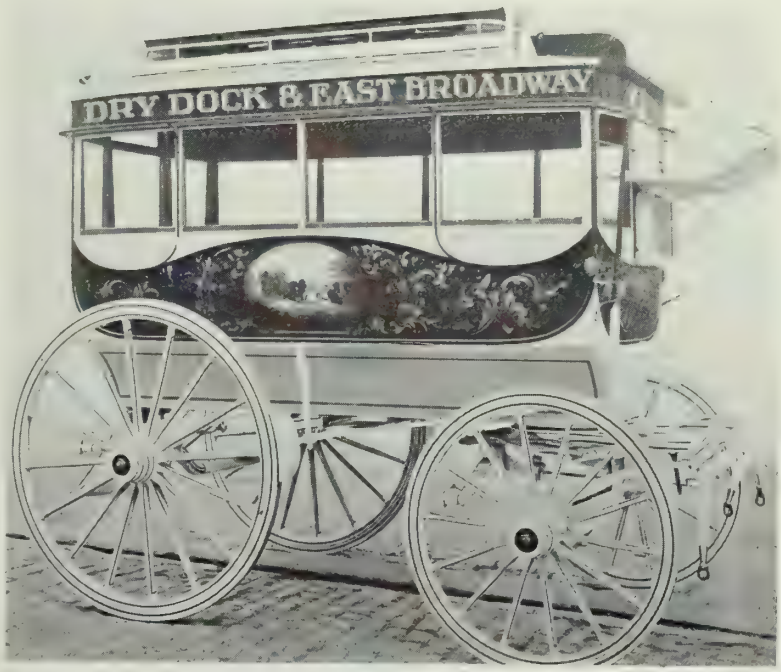
The Development of Street Cars

By Walter Raleigh

Washington

AMERICA'S first street railway was an ox cart.

One hundred and eighty-one years ago, in 1746, there was a regular line of lumbering vehicles moving up and down Broadway, New York. But the faithful ox, although able to pull a score or more passengers, was soon too slow for even the first Americans. Next came the omnibus, pulled by horses. These early stages were strange looking contraptions, like great overgrown private carriages, painted in gaudy colors, each with its own name emblazoned on its sides. To the people of that day it looked as fast and wonderful as the great locomotives that pull the Twentieth Century Limited.



When This Jaunty Vehicle Rumbled Along Down Broadway in the Early Days Everyone Knew It Was Coming. This Is Practically A Copy of the Lady Clinton, First Street Railway Service in New York.

The "Lady Clinton" was such a one—the special pride of New York town. Known as "an elegantly appointed four-horse chariot," it dashed up and down the streets attracting much attention. Drawings and advertisements describing its service are found in early day newspapers.

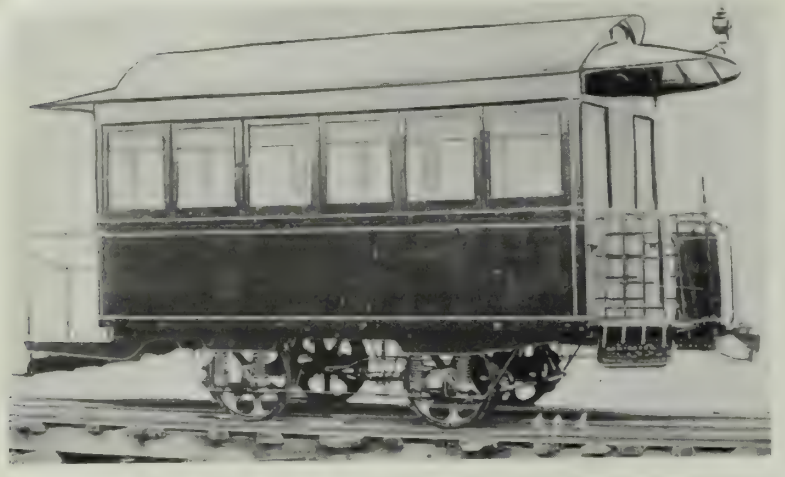
This Lady Clinton looked like two royal coaches joined together with a door. Instead of the passengers facing the front or back, the seats were arranged along the sides. The driver, always in bright livery and high hat, sat in majesty on his seat on the roof. He carried a long whip. A newspaper of that time says: "Omnibuses exceeding a hundred in number roll incessantly over the paved streets, administering equally to the purposes of business and pleasure, adding to noise and bustle, and forming an object of such prominent attraction as to cause New York to be called 'The City of Omnibuses'."

At last these carriages became too crowded and too slow. A newspaper a few years later said: "You may be a modern martyr by riding in an omnibus. The discomforts, inconveniences and annoyances of a trip in one of these vehicles are almost unbearable. From the beginning to the end of the journey a constant quarrel is progressing. The driver quarrels with the passengers and the passengers quarrel with the driver, quarrels about getting out and quarrels about the ticket. The driver swears at the passengers and the passengers scold the driver through the straphole. Thus the omnibus rolls along a perfect bedlam on wheels."

The "straphole" can be seen in some of the old carriages of that early day now found in certain museums. The driver's right foot was connected with the back door of the stage by a leather strap. This strap served both as a bell-rope and a door lock. When anyone wanted to get out he would give the driver's leg a sharp tweak at the proper corner, the driver would bend his knee so that the door could be opened, and out hopped the passenger.

But the strap-hole acted as a fare-box as well. Every one who entered the stage was supposed before many blocks had been covered to hand his fare to the driver through the hole. If a man was absent-minded the strap would strike against the ceiling as a reminder.

Next came the "fast" horsecar. At first it was nothing more than a carriage on wheels that ran on a wooden track. But the steam trains that were then developing helped the street cars. The city people who left the country thought these compartment horse



One of the First Horse Cars in America. The Floor Was Covered With Straw to Keep the Passengers' Feet Warm if Possible.

cars were wonderful, as did the city folk who had been riding the omnibuses. Each compartment held ten persons and there was room on the roof for ten more. The later cars were of the modern type with iron wheels and iron rails.

But even the wonderful horse cars failed to suit a traveling public. A man of that time (1834) said that a passenger on these street cars "should lose his sense of smell, have the ability to shut himself up like an umbrella, be able to hang to a platform by the lids of his eyes, hold drunken men on his lap, and keep his temper." Another one tells of the hard seats and the cold cars and the darkness at night. In the winter there was straw on the floor to help keep the passengers warm!

Some of the horse cars of the early days had a ladder to the roof. On hot days so many would climb up there that the roof would cave in. There were exciting times when the car would run off the track and bump over cobblestones. There were the turn tables, and the extra horses used to make the cars go still faster.

In Denver one of the horse car lines went up a long hill. The horse, of course, pulled it up, but when the car came down the hill the horse rode on the back platform! This horse was on the job so long that his shoes wore deep grooves in the platform flooring.

Next came the cable cars. These were the great wonders of the age. People would come out to watch them go by, apparently without any power or visible means. Underneath the tracks was a continuous cable to which each car would cling by a grip that reached down through a slot; the tighter the grip the faster the speed, until the car would be able to go as fast as the cable, but no faster.

The gripman corresponding to the motorman of today, operated the car by the raising and lowering of the grip that grasped the steel cable. If he allowed the grip to take hold too quickly the car would be jerked in a terrible way and perhaps the cable would break; all which may be news to the present generation.

The cables had to be followed on the curves, for it was discovered that if the grip did not hold fast on the curves the car would stall. So it was not long before every turn in the line vied with other cable car lines on some "dead man's curve," where accidents would occur.

In large cities such as New York, Chicago, Denver and San Francisco, the cable cars lasted a long time. When there were steep hills the pulling of a heavy car over them by means of a cable was found to be a better way than the early electric cars that lacked sufficient power. Then, too, a cable car could go over a steeper hill than even a modern electric car. There were many accidents. A cable would break. These long steel ropes, miles and miles in length, had to be wound around giant spools at the power houses. The car would go one way on one cable and another way on another. Going down hill they would coast with a brake that pressed on the track, for on the wheels there would be too much friction and too great heat. The man at the cable house that watched the wire rope as it came in to wind on the great spool had a very nervous and very responsible job. For many hours at a stretch the cable would be watched constantly to

Then Came the Cable Cars. The Present Generation Knows Nothing About Them, Fortunately. Such Cars Still Are Used On Certain Hills in Seattle.

catch the least broken wire strand. Should one be found the whole system had to be stopped because that strand might throw too much weight on some other weak place, and before that hundred-mile cable again came back there would be a big break with much damage and perhaps loss of life.

But ox-carts, and stages and horse cars and cable cars had to give away eventually to the electric car. On May 4, 1888, the first overhead electric street car was operated in the city of Richmond, Virginia. Frank J. Sprague pioneered the way. This street railway is still running and operated by the same system of electricity.

In Baltimore, Md., there was the first motor street railway. This was a motor-pulled car obtaining its power from batteries and later from a third rail. The cars were the old horse cars. When the cars went off the track, everybody got out to help push them back on, but only after the motorman had assured them that they would not "be struck dead," or get a terrible shock."

When the Richmond company was started there were only 19 electric lines in the whole world, and ten of these were in the United States. If all the tracks had been put together they would have reached only 60 miles. Yet so successful was this early venture, and so much help did it give to the nation and the problem of running the street railway systems that in a year there were 50 electric overhead street car companies operating in the United States, and in another year more than 200 with 1200 miles of track.

Electricity became and still is the most popular motive power for street cars. Now there are many different ways of using it—the elevated with its third rail, the trackless trolley bus—the subway system and the fast interurban lines.

The United States leads the world in street car lines operated by electricity. There are 857 of them and 44,000 miles of track with 105,000 cars, and they carry 16 billion passengers every year. This is really more than 18 times as many riders as the steam roads carry and many times the number of paid riders as go in the buses run by gasoline motors. It seems that everybody likes to ride the electric lines today, or else almost everybody has to. Dividing up all the rides it would make each person in the United States take 117 rides a year. Back in 1890 the average number of rides per person was only 32.

The electric street car systems of the various cities and towns of the nation have many ways of making the all-power "juice" work. There are now electric switches that can be controlled by the motorman and there are also switches that are controlled by a man in a tower who has a moving diagram with lights that tell him what to do. There are underground trolley systems installed in the old slots where the powerful steel cables used to run, and there are automatic systems of lights and switches in the cities.

There are those who believe the street car's days are numbered because of its inflexible route. For years this fact, added to the very dreadful noise of operation has made street cars unpopular. But science has overcome some of these objectionable features, especially the noise. There are devices now on the market, noiseless drives, big powerful motors, more and more comfortable cars, plenty of standing room, good vision for those who get the seats, everything to make a street car as comfortable for passengers as such a conveyance can be made.

But still the people grumble. Now they turn once more to the buses as they began in the days of the Lady Clinton—but a different kind of bus; rubber tired, handsome vehicles seating 40 or more passengers with standing room for another 50 or 60; coaches as big as a street car of modern make, as comfortable as a Pullman. Has the limit in luxury been reached?

Here We Have the Most Modern Type of Street Car; Large, Comfortable and Practically Noiseless.

Why Railroad Men Go Wild

Two young men living in Los Angeles needed some money one day last month so they went out boldly, in daylight, and stole ten miles of heavy copper wire from as many miles of the block signal system of the Santa Fe road creating a situation that disrupted all train service for several hours and threatened serious accidents. Detectives recovered the stolen wire, valued at $10,000, in an East Third street junk shop where the men had sold it.

According to the investigators the men spent several hours Sunday cutting down the wire. Railroad men who saw them at work said they thought they were company linemen and offered no interference while the men took turns climbing poles to remove the wires.

From Colorado Springs, comes word of the arrival April 22 of Verlena Dena Wall. Verlena came in on a Denver & Rio Grande Western train. She had been expected of course, but no one, not even her adoring mother, imagined she would take that particular train. Sure enough, however, somewhere between Wolcott and Minturn there she was and she hadn't a thing in the world to wear! The train crew was pretty badly rattled for a while but two trained nurses were found among the passengers and at Minturn a doctor was picked up. "Of all the railroading I've ever done," said the conductor, "this does beat all," while the Pullman porter, for once in his life, had no complaint to make about the extra birth in his car.

Bertha Hanaman, 12 years old, started to run across the Southern Pacific track near Lodi, California, one morning. The idea didn't occur to her until a train came roaring along. Of course she stumbled and fell in front of the train. Harry Baldwin, a laborer saw the child fall, knew he couldn't reach her in time to pull her from danger so he cried to her to lie flat and keep still. For a wonder she obeyed—like the little boy in Holland, you remember, in McGuffey's Third Reader ages ago?—and the train passed over without hurting her—an engine and ten freight cars.

Santa Fe detectives and county authorities are hunting a band of train wreckers who tried to derail a Santa Fe train bound for Bakersfield at a point five miles south of Merced.

Action of Engineer Joe Fugas in bringing the train to a stop only a few feet from a tie braced across the rails averted a wreck, officials said. Fugas's train was a few miles behind a fast eastbound train which had found the track clear.

It is the belief of officials that the plot was laid to wreck the faster train, but that the wreckers mistook the two.

Patrick Norton, the New York police say, was drunk when he fell to the tracks from the northbound platform of the 145th street station of the Seventh avenue subway into the path of an oncoming express. Sergt. Michael Skalla and Edward Jones leaped to the tracks after Norton while 50 persons on the platform held their breath. Skalla and Jones tossed Norton to the platform and jumped to safety themselves just as the train pulled to a stop.

Contrary to widespread belief that lightning never strikes a train, the crew of a west bound Burlington train between Holbrook, Neb., and Cambridge report the last car struck during a storm. The lights of the car went out just as there was a blinding flash of lightning. The car was streaked with smoke and light bulbs and fuses were burned out.

At Alameda two boys 6 and 8 years old wondered whether a Southern Pacific Electric train would flatten some railroad spikes if they were placed on the rails. Their experiment threw a train off the track, endangering the lives of 17 passengers, tearing down three steel electric light poles and causing a traffic jam which blocked traffic for hours.

At Bengal, India, Ismail Shaik, engineer of a freight train on the Eastern Bengal Railway, stands charged by the police with committing a "negligent act." He ran into an elephant. The "tusker" and its mahout were killed in consequence of the collision. The animal was a very valuable one the property of the Rajah of Dauripur, who instituted the proceedings against the train driver.

If you happen to know an old time yardmaster, John Dixon by name, tell him the police of Spokane are looking for him—someone has bequeathed him a pot of money, something novel in railroad circles. Dixon worked in the S. P. yards at Houston, during the '80's.

Want to Learn

There are four things in life which we ought to learn. Here they are:

1. Learn to laugh. A good laugh is better than medicine. When you smile or laugh, your brain for a moment is freed from the load that it ordinarily carries.
2. Learn to tell a helpful story. A well-told story is as welcome as a sunbeam in a sickroom.
3. Learn to keep your troubles to yourself. The world is too busy to linger over your ills and sorrows.
4. Learn to stop croaking. If you cannot see any good in this world, keep the bad to yourself.

The cowcatcher is obsolete. What a locomotive needs is something to cow fool drivers.

Here He Is Again, the College Man

What A Survey Developed

By Marion B. Richardson

IT IS the belief of the railroad division's sub-committee on professional service that the opportunities afforded the mechanical engineer in the railroad supply industries are equal to those afforded in any industry. This belief is based on several facts, probably the most significant of which is that competition with other college trained men is not as great as is the case in many other industries. A study of the careers of 150 railway officers holding positions from president down to master mechanic, show that only 43.7 per cent are college graduates. The railroad supply industry, however presents a slightly different ratio, 63.6 per cent being college graduates out of a total of 113 rail supply company officers ranging from president down to sales representative. In both cases the officers were selected at random with the primary object of obtaining as accurate a picture as possible of the competition to be expected by the mechanical engineer in both industries.

These figures are also significant of one other important factor pertaining to the success of the individual in railroad and rail supply work. Knowledge of railroading, individual adaptability, practical experience and a willingness to work appear to have considerably more value in the minds of the average executive than college education.

It is not the general practice of the railroads to extend preferential consideration to college graduates. It is expected that the college graduate will start on an equal footing with the non-college man and show his worth in actual service. In other words, the college man is worth comparatively little to a railroad company until he has had considerable practical training and experience. This, in the main, is also true of most industries employing technical graduates.

Many a College Man Starts as a Car Inspector. If He Begins With the Right Road He Needn't Tap Wheels Very Long. But Watch Out, Son—

It is essential that the young mechanical engineer know his own characteristics and ability. In finding this out he can obtain considerable assistance from his friends and faculty advisers. The graduate from an engineering school who anticipates a railroad career should carefully consider two questions, namely: Do I want to use my

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Mr. Richardson, as chairman, presents the conclusions of the Committee on Professional Service, Railroad Division, A. S. M. E. This is a part of the committee's report.

The Division Engineers Have Work to Do in Times Like This. The Mississippi Flood Cost the Railroads Millions.

engineering education as a basis for a purely engineering career, or do I want to use it, with a supplementary business education, as a means eventually of reaching an executive position?

The man who would follow the first course and who is interested in engineering work for the work itself, or in new design and construction, is sure to suffer somewhat of a disappointment in railroad service. Unfortunately, relatively little of the work performed by the average railroad mechanical engineering office is of a nature that will keep a talented designing engineer continuously occupied with new and interesting problems. The development of the railroad supply industry has had an important effect in placing the larger part of the design work in the mechanical engineering department of the manufacturer. In all probability the man following the first course will find more opportunities in the supply industry.

If the college man entering railroad service is the type who wishes to use his engineering education as a means of reaching an executive position, either in or above the engineering department, then there is one thing that cannot be overlooked — as he advances he gradually becomes more of a business man and less of an engineer. If he has failed to educate himself in the principles of business, the chances for becoming an executive are not great. The railroad executive whose duties may demand an engineering knowledge are such that a relatively small portion of the things which he must know involve a detailed knowledge of engineering principles as compared with the principles of business administration.

The mechanical department of a railroad is but a part of an immense business organization, which like any other business, is operated to make money. Unfortunately, the mechanical department is in a position principally to spend money and save money; as a consequence, the labors of the members of that department are often looked upon as "non-productive." If a college man intends to enter railroad service and be satisfied with what he can learn in any office or department, he will make no greater progress on the railroad than if he pursued the same tactics in any other industrial organization. The big thing is to know enough about the job ahead to be able to step into it when the opportunity offers and this calls for self education in the principles of business.

Unfortunately, a railroad cannot be run on paper. Operations may be carefully planned beforehand but conditions over which no one has any control may make it necessary to alter these plans at the last moment. Therefore, any college man in railroad service who fails to get as much as possible of the practical side of railroading is doomed to make little progress in the railroad game. Any man who has spent four years in college learning how to think of himself certainly should not be at a loss for ways and means to get all he wants on a railroad.

The railroad division's sub-committee on professional service does not believe that to confer a distinctive title upon a college man in railroad service would materially better his situation. In fact, some consider such titles a considerable handicap. "Titles can be created with the flourish of a pen and wiped out with a bad breakfast." Some of the real jobs on any railroad are those which carry unimposing titles, and on the other hand, some jobs with magnificent titles leave much to be desired on pay day. Every man who has had practical railroad experience realizes that it is desirable to emphasize his education as little as possible. What the young mechanical engineer should do,

in railroad work or elsewhere, is to lose his identity as a college man as quickly as possible.

There are two principal reasons why advancement in railroad work may be slow. First, because the business as a whole is so complicated and departmentalized that it takes years of actual work to become acquainted, even in a general way, with many phases of it. This is in contrast with any line of business that consists mostly of one or two operations, such as buying and selling, or the manufacture and sale of a limited variety of articles, the whole plant being in one place. In any such line, one with reasonable aptitude and liking for the work can much more quickly master the details of it and be in position to advance more rapidly than would be likely in a more complicated and departmentalized business.

The second reason is that the railroads have long since come to a stage of routine as contrasted with immediate and rapid growth. They are organized to handle their business from day to day but are not expanding in any such manner as to call for a steady and large supply of trained men to fill newly created responsible positions. A man who may be very capable is likely to find himself in a situation similar to a bucket in a bucket brigade; that is, he passes along just as fast as those who happen to be ahead of him travel. This is an unavoidable condition in any organization that has attained its growth.

The second reason, however, is subject to a number of modifications. The railroad industry has been going through a number of important developments in recent years with respect to its employes that can not help but effect an improvement in the status of the mechanical engineering graduate. Many railroad companies are utilizing the facilities afforded by various state university extension departments, vocational education bureaus, correspondence schools and other educational organizations for the training of foremen and supervisors. The requirements for the enrollment of regular apprentices are becoming more strict. Some railroads are now requiring a high school education or the equivalent before a man can enroll as a regular apprentice. Many of the larger railroads are sponsoring such activities as the American Railway Boys' Clubs, the educational features of the Railroad Y. M. C. A., Younger Railroad Men's Conferences, etc., in the effort to raise the standards of supervision. Of course, this means more competition for the college graduate. But it also means more adequate appreciation and utilization of college training by the railroad executives.

A general idea of the number of supervisory positions in which mechanical engineering training would be of service is shown in Table 1 herewith. Care should be shown, however, in the use of the total figure, due to the fact that many of the executive staff officers fill positions requiring legal, medical or business training. Furthermore, this total does not include special apprentices. The division officers and assistants include men in all departments. The larger proportion of the architectural and engineering assistants are in all probability men of civil or mechanical engineering training. Special apprentices usually are made inspectors upon completion of their course.

Just Out of College, Ready for What Graduates and Others Call Life's Mission.

Table 1.

Executive, general officers and assistants	7,551
Division officers, assistants and staff assistants	9,503
Architectural, chemical and engineering assistants	7,685
Subprofessional engineering and laboratory assistants	4,232
General foremen, M. of E.	1,440
Assistant general foremen and department foremen, M. of E.	11 129
Equipment, shop and electrical inspectors	1,585
Material and supplies inspectors	1,913
Gang foremen and gang leaders, M. of E.	11,036
	56,074

A comparison of the total number employed with the total number of officers, shows quite clearly that the principal job of the majority of mechanical department officers pertain more to handling and leading men than to strictly mechanical engineering work. To illustrate, the superintendent of the car department of one of the smaller Class I railroads in the East has an average of 1200 men under his jurisdiction working at different points on the system. As a further illustration, there are employed by the railroads in the maintenance of equipment about 484,000 men. As a comparison, there are about 1400 general foremen and 11,000 assistant general

foremen and department foremen employed by the Class I railroads in the mechanical department. The general foremen are, therefore, captains of an immense army. Their work may be roughly divided into two parts: first that of contributing to improvement in shops, shop methods, and shop machinery, and secondly, that of supervising and training employes and improving their morale.

This, in brief, is a summary of the experience and training the college graduate must have to fill higher positions. Finally, the young mechanical engineer must know and appreciate the fact that the railroad is subject to regulation by the government. As a rule, government agencies are slow to move and are likely to hinder the development of an industry unless they are able to keep in step with the times. The rules and regulations laid down by the Interstate Commerce Commission affect the work of all departments of a railroad and it is necessary that the railroad officer know just how these regulations relate to the work of his department. The railway supply company officer must also be sufficiently familiar with the rules and regulations of the Interstate Commerce Commission to meet its requirements in the materials that his company manufactures. Government regulation, however, has its good features as well as its bad and fortunately the policy of the various bureaus of the Interstate Commerce Commission is one of helpfulness rather than hindrance. In addition, the American Railway Association, of which practically all the railroads are members, makes certain rules and sets up standards with which the mechanical department officers of the railroad and the railway supply company officers, must be familiar. Summarizing the committee says training in the utilization of statistics and reports is a necessary qualification to the mechanical engineer in both the railroad and railroad supply industries.

The organization of a railway divides itself naturally into several main departments that have clear lines of demarcation. These are legal, traffic, treasury, accounting, and auditing, operating and maintenance of way, and employment.

Loving Cup Given to D. J. Brumley, Retiring President of the A. R. E. A., During the March Convention at Chicago.

Men of mechanical engineering education are in demand for service in the maintenance and operating departments. The importance of mechanical engineering training with respect to the work performed is greatest in the maintenance of equipment department. The work of the traffic department. The work of the traffic department can be compared to that of the sales department of a manufacturing concern and in fact, it actually does sell the service of the railroad to the shipper and traveler.

The operating department mans and moves the trains, operates the yards and mans the stations. It is generally considered to be the most important department. Excluding those who started their railroad career in the executive department as secretary to an executive officer of as chief clerk, it is the operating department that supplies the president on most railroads. The good operating man seldom finds it desirable to leave railway service to work in any other industry. When he does, it is to take a position where the executive qualities of leadership bring him greater reward.

The engineering or maintenance of way department is another that has always seemed to have received proper recognition. Many railroad division engineers or chief engineers have succeeded in stepping over into the operating department and thus proceeded on their way to the top. The list of railway presidents who started in railway service as rodmen or transitmen is quite a long one. This information is of interest to the mechanical engineer whose technical education is similar in many respects to that of the civil engineer.

Generally speaking, the mechanical department is usually subordinated to the transportation department. It seems to lack a class consciousness and in this respect is quite different from the engineering department. The mechanical department is in charge of the design of cars and locomotives and of their maintenance in good order. No less than 25 per cent of all railway operating expenses and from one-half to two-thirds of the expenditures for capital improvements come under the jurisdiction of this department. This shows that the job of the mechanical department officer is one of importance and great responsibilities and requires a man capable of exercising mature judgment.

This statement undoubtedly is emphasized by the figures given in Table 2, which shows the years required for mechanical engineers to reach certain positions in the mechanical department of a railroad. One mechanical engineer worked for 49 years before becoming head of the mechanical department of his road. Another worked for 10 years. The average time required

for all those of whom the sub-committee obtained complete data was 22.8 years.

Table 3, which shows the number of years required for mechanical engineers to reach certain railroad executive positions, cannot be considered as indicative of the actual opportunities afforded members of the profession in reaching the positions mentioned. Changing conditions in the railroad industry will, in all probability, see more mechanical engineers as railroad presidents. This is perhaps illustrated by the fact that there are now six vice presidents who have come up from the mechanical department. The office of chief purchasing officer if also included in this table on account of the fact that some railroads managements consider technical training to be a necessary requirement for the duties of this position. At the present time three mechanical engineers are serving as chief purchasing officers.

Station on the Oahu Railroad & Land Company's Lines, Hawaiian Islands; Built by Kanaka Labor Under American Engineers.

Table 2. Years Required for Mechanical Engineers to Reach Certain Positions in The Mechanical Department of a Railroad

	Longest time	Shortest time	Average
General supt. of motive power or head of mechanical department	49	10	22.8
Assistant or division supt. of motive power	36	7	18.8
Mechanical engineer	33	4	8
Engineer of tests	19	5	9.75
Engineer of motive power	24	7	18.

The interests of the railroads and the railway supply industry are so intimately interwoven it is impossible to separate them. The railroads are interested in furnishing that standard of transportation which will best meet the public requirements. They are specialists in transportation, and that in itself is no mean task. They are large purchasers of material and supplies, which is indicated by the fact that for several years—since and including 1920—the Class I railroads have expended in excess of a billion dollars a year, chargeable to the operating account for materials and supplies, exclusive of fuel for locomotives.

The railway supply manufactures, specializing upon the development, production and sale of equipment and supplies and enjoying plenty of competition, have made a remarkable contribution to the railroads and the public served by them. The supply manufacturer must keep in intimate contact with the railway operating problems and practices. He frequently goes to the railroads for men for important places in his organization and relieves the railroad organizations of production details which they are not in a position to handle.

Table 3. Years Required for Mechanical Engineers To Reach Certain Railroad Executive Positions Via The Mechanical Department

	Number of officers	Longest time	Shortest time	Average
President	1	38	..	38
Vice president	6	40	11	30.3
Chief purchasing officers	3	35	26	32.1

Over 40 per cent of the executive and technical officers and sales staff of railway supply concerns, promoted since December, 1919, have either started or worked some time in their careers for a railroad. Approximately 500 manufacturing companies engaged in selling supplies to railroads, wholly or in part, are listed in the Pocket List of Railroad Officials. These supply companies employ approximately 7000 men as executives and sales engineers, a large portion of whom the sub-committee has good reason to believe are men of technical education. There are also about 40 private car companies that own and operate over 1000 cars that should also have need for a limited number of mechanical engineers. Magazines published to serve the interests of the railroad industry employ a limited number of mechanical engineers on their editorial and business staff. These publications, however, employ only mechanical engineers who have had considerable railroad experience.

Among the facts the young mechanical engineer would like to know before entering the employ of any company are those relating to the manner in which promotion is gained. In other words, must he play politics; be a relative of some high officer, either through birth or marriage; or is promotion gained solely through merit? Naturally such information is practically impossible to obtain until one has been in the employ of the company for a time and has an opportunity to discover some of

Table 4. Average Ages of 25 Railroad Officers in Each Grade Shown. Time Required to Reach Certain Positions and Time Gained by College Graduates

	Average age, years	Average time in R. R. service, years	College trained, per cent	Average time for non-college man, years	Average time for college graduate, years	Time gained by college graduate, years
President	58.3	30	53	34	24	10
Vice president	50.8	28.1	48	30.7	25.2	5.5
General manager	49	30.5	16.8	31.4	26.2	5.2
Superintendent of motive power	43.8	25.8	44	29.9	19.9	10
Mechanical engineer	35	13.75	80	14.6	13.5	1.1
Master mechanic	47.4	22.7	20	24.1	15.2	9.4

the inside workings. Fortunately, the majority of the Class I railroads have such large organizations that family influence and politics do not have much weight in obtaining promotion. In fact, a careful check of various records and statistics of the ownership of official personnel of the railroads shows that "family controlled" companies are few in number and are practically all small roads.

Analysis of the careers of officers in both the railroad and railway supply industries show that the college graduate has a distinct advantage over the non-college man. Table 4 shows the results of a study made of the railroad careers of 25 railroad officers in six different grades. The right hand column of the table shows the number of years gained by the college graduate in reaching each position listed over the time required by the non-college man in reaching the same position. The officers, selected at random, are all employed by Class I railroads.

In studying this table it is well to keep in mind that the superintendent of motive power is the active head of the mechanical department. A master mechanic is head of the repair shops of a division and quite often has charge of both locomotive and car repairs. On most roads, however, the master mechanic has only locomotive maintenance to supervise. The mechanical engineer usually reports to the superintendent of motive power, and his work generally pertains to the design, alteration and selection of rolling stock and shop equipment. Practically all of the mechanical engineers in Table 4, are college graduates. Those who are not college graduates obtained their technical training at night school or by home study. This accounts for the small gain of 1.1 year by college man over the non-college man. In other words, practically all of the mechanical engineers employed by the railroads have finished a college education or its equivalent.

Table 5. Careers of Officers Holding Certain Representative Positions in Railway Supply Companies

	No.	No. who started on R. R.	No. who started with R. S. Co.	Common school	Education High school or equiv.	College grads.	Per cent of college grads
President	28	6	22	4	6	18	55
Vice president	37	22	15	10	8	19	51.4
General manager	13	4	9	2	1	10	77
Chief engineer	11	4	7	1	1	9	81.8
Manager of sales	12	7	5	2	3	7	58.3
Railroad representative	12	9	3	2	1	9	75

The sub-committee felt it to be essential to have all the information contained in this report of as recent date as possible. Table 5 shows the careers of officers holding certain representative positions in railway supply manufacturing companies. In collecting data for this table, only the careers of officers promoted since December, 1919, were considered.

One of the questions asked in the questionnaire mailed to the various railroad and railway supply companies in 1927 was: What length of time is required for a man to reach a position paying, say, $5000 a year? On roads paying this much ten years won't be required; in supply companies no time could be named.

A tabulated analysis of the mittees from the faculties of a large number of technical institutions in connection with an investigation made by that society in 1924. The information was obtained by the faculty committees from their respective alumni.

Table 6. Average Ages, Time Required to Reach Certain Positions, and Time Gained by College Graduates—Railway Supply Companies

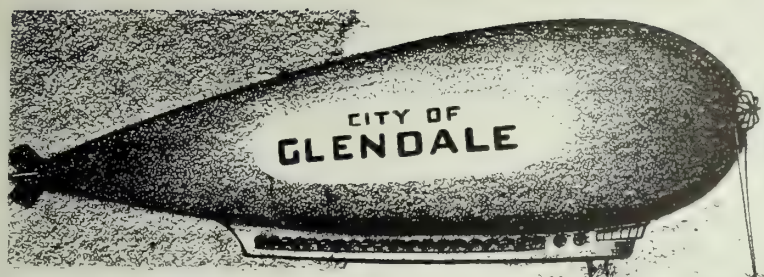
	Average age, years	Average time in R. R. & R. S. service, years	Average time for non-college man, years	Average time for college graduate, years	Time gained by college graduate, years
President	56.6	27.1	35.5	22	13.5
Vice president	47.75	28.9	32.2	23.8	8.4
General manager	44.7	29.2	32.4	26	6.4
Chief engineer	46.25	23.2	31	20	11
Manager of sales	46	21.75	27.25	18.9	8.35
Railroad representative	43	27.1	20.9	3.8	17.1

carnings of engineering graduates in all industries is shown in Table 7. The data shown in this table were supplied to the Society for the Promotion of Engineering Education by cooperative com-

Table 7. Analysis of Earnings of Engineering Graduates in All Industries as of June 1, 1924*

Class	Years since graduation	Number reporting	Annual Earnings, in Dollars: Limit of lowest 25 per cent	Median	Limit of highest 25 per cent	Maximum	Most frequent
1924	0	1,191	1,200	1,476	1,560	4,080	1,200
1923	1	1,218	1,560	1,800	1,980	5,100	1,800
1922	2	1,023	1,800	2,100	2,400	9,000	1,800
1919	5	309	2,400	2,860	3,500	25,000	3,000
1914	10	498	3,110	4,000	5 100	50,000	5,000
1909	15	430	3,600	5,000	8,000	49,500	6,000
1904	20	238	4,000	5,500	10,000	90,000	4,000
1894	30	116	4,500	7,500	15,000	100 000	6,000
		Total 5,023					

* Study of engineering graduates, published by the Society for the Promotion of Engineering Education, p. 287.



Going Up! A Dirigible With Elevator Service

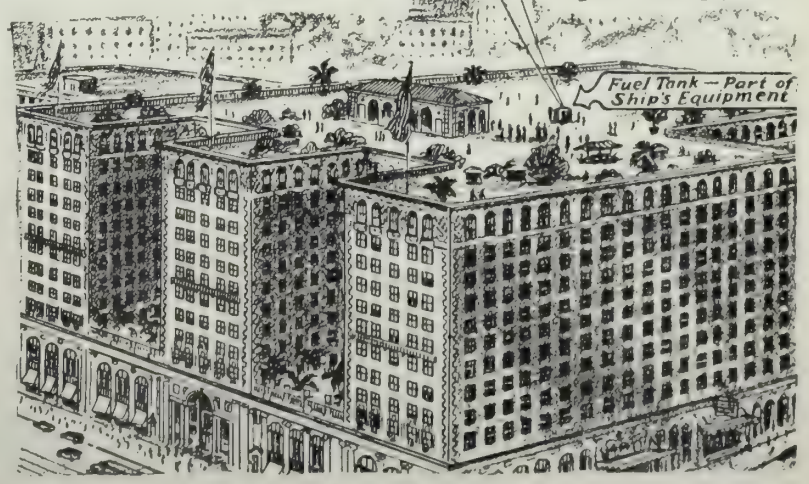
By Charles Dillon

IN THE days of Ivan the Terrible, a serf named Nikita was beheaded ofter giving what history says was a successful demonstration of flying with wings fastened to his arms in imitation of a bird. An English merchant, viewing what probably was the first test of a glider, tried to buy the thing, but the czar ordered it destroyed declaring such a contraption was contrary to the laws of God as they were at that time understood. Nikita lost his head, but the idea conceived there continued to live.

This diverting episode is recorded as happening in 1568 or thereabouts. The world's interest has been directed to a number of things since those far-off days, but despite all counter attractions men have fondled the idea that some day, somehow they would fly. They have been laughed at, derided, ridiculed as have all men with great ideas, and they have died, but throughout the ages the idea that man could fly has come down to our well-known posterity, and now is doing fairly well, as all men know. Wasn't it Talleyrand who said an idea never could be killed whatever you did to the man?

All of which is preliminary to the story of another great idea, an outgrowth of others like it, now coming to realization, it is hoped, in a mysterious hangar at Glendale. You may hear more about the Slate all-metal dirigibles in New York than on the Pacific Coast; one usually has to go away from home to know what is going on near his own back yard. But whether the news has penetrated your region or not the chances are that one of these fine days, not very far in the future, it is hoped, you may see one of these big ships land its passengers on the roof of the Pennsylvania hotel in New York City.

In an age producing marvels every day no intelligent person cares to express doubts concerning the practicability of any man's invention. So many utterly impossible things are being done, so many have been done in the last quarter of a century. We all know the big guns' limit of fire is 21 miles, or at least that was what we supposed until Germany began dropping shells on Paris from a very much greater distance during the World War. Langley, Zeppelin, Bleriot, the Wright brothers, Lindbergh, and now the German Baron Whatshisname and the Irish major Fitzmaurice, one by one, have imagined things and then have done them, mighty accomplishments for the future comfort and convenience of all humanity. Incredulous skeptics come to doubt and smile patronizingly but



stay to wonder and then to admire.

And now here is Captain Thomas B. Slate, formerly of Nevada, with his all-metal dirigible that is to go into the air and stay there. The visitor goes to the big hangar filled with the perfectly excusable spirit of dubiety. But he doesn't stay that way very long; not in the presence of Captain Slate. It isn't possible. To begin with, everything in the building is different from what the visitor had expected to see. From the captain down the list of workers everyone is intensely serious and most entirely and completely occupied with his job. There are no reformed plumbers here. Every man seems to have his tools where he can use them. Nobody stops to light a cigaret. There is no smoking. No idle talk. Just the deepest concentration over the work to be done. Men working as if they believed in what they were doing, tireless enthusiasm, energy; the captain walking about, talking quietly, in modulated tones, no one paying any attention to him, no one acting as if he was being watched. Not a great deal of noise, and no confusion anywhere.

A part of what Captain Slate says sounds a good bit like things you may have read in Kipling's prophecy in the "The Night Mail," published long years ago, that dirigibles would be the final medium of aerial flight. Experts, the captain says, are turning particularly to rigid airships to answer the demand for rapid, safe economical transportation. Here, he points out, are innovations in lighter-than-air practice with every principle involved based on sound and familiar engineering laws, a craft built entirely of metal, with a greater pay-load percentage, propelled by a novel method, a ship differing from anything you have seen.

The first difference noticed is in the method of construction. Instead of having men crawling all over the ship with the danger of falling from high places, all the work is done from a platform or scaffold a few feet above the floor. As fast as metal is put into place the entire ship revolves and presents new space to be filled. There is no straining and no unnatural bending of backs.

International Newsreel.

Working in Safety on a Platform, the Dirigible Revolves As The Men Build It.

The second novel feature is in the method of propulsion known as the air displacement principle. By means of a steam turbine-driven centrifugal blower in the ship's nose, the air pressure in front of the ship is displaced and is subsequently replaced on its rear taper, creating on this portion of the hull a positive pressure which thrusts the ship forward into the negative pressure ahead.

The design of the metal hull of Captain Slate's dirigible is based on the double arch, or eggshell principle, and its superior strength is obtained, not from an inside frame as is the case with present types of airships, but from the cover itself by the continuous curvature of the surface in all directions. The cover, which is also the lifting gas container, is corrugated longitudinally to give the hull the necessary rigidity. Riveted to the cover on the inside and placed at frequent intervals along the contour are circular ribs which space the corrugations in the cover and hold the hull in shape. The hull has no other internal structure. The fact that the ship has no inside rigid frame, permits the expansion and contraction of the sheet duralumin cover without throwing any additional stress on the hull.

The Slate dirigible is to have an anchor and elevator system of landing which eliminates mooring masts and expensive ground crews and enables the ship to effect a landing at any desired point without previous preparation or assistance from the ground. A clear space some 30 feet square is all the area required. The landing is accomplished by hovering the ship over any chosen spot and lowering an anchor either to the ground or to the roof of a building in the heart of the city, from any altitude up to 3000 feet. Then, with the anchor cable as a guideline, the elevator is operated to and from the ground taking on and discharging passengers similarly to and as safely as the elevator in an office building. This system of landing actually adds to the payload of the ship due to the fact that it is not necessary to descend from the ship's flying level to make a landing. The illustration shows this principle in operation.

The Slate ship utilizes more than 33 per cent of its gross lift in passenger space, or pay load, while in the Los Angeles less than two and one-half per cent of its gross lift is devoted to that purpose, and it is not unreasonable to believe that one third of a ship's gross lift can be used for pay load in lifting lighter-than-air craft.

A Section in the Great National Airplane Show in Detroit, Last Month. Here Were To Be Seen the Latest Developments in Aviation.

The ship now under construction in Glendale is a new type, 212 feet long and 58 ft. at the largest diameter. It has a total volume of 330,000 cubic feet, and, using hydrogen as a lifting medium, has a total lift of approximately 21,000 pounds and a pay load of 7,000 pounds. It will carry 40 passengers and a crew of five. The cruising range is approximately 2,000 miles at an estimated speed of 100 miles an hour. The steam heated cabin, which is rigidly fastened to the underneath side of the ship, is equipped with Pullman accommodations, individual radio, and other luxuries of modern transportation.

Already arrangements have been perfected for using the roofs of the Los Angeles Biltmore and the chain of Statler hotels as stations, the end of the journey being on the roof of the Pennsylvania in New York City.

The National Air Races

The national air races, which will be held September 8-16, will focus the eyes of the aviation world on Los Angeles for nine days. Cash prizes of $125,000, the largest ever offered, are attracting the best flyers in America and Europe. More than 1500 airplanes will be here for the meet and 15,000 pilots and mechanics.

Dudley M. Steele, chairman of the National Air Race contest committee, announces five national and international races will end at Mines Field. They are:

(1) Non-stop transcontinental air race form New York.

(2) Air derby from New York.

(3) International air race from Windsor, Canada.

(4) Pan-American air race from Mexico City.

(5) California air races from San Francisco and Oakland.

Three of the nine days will be devoted to the national air races. These are held on a closed course and are visible only from the grand stand. At these races the official international speed records for 1928 will be established. All contests will be held under the supervision of the National Aeronautical Association's contest committee, of which Orville Wright is chairman.

Wright's appearance in Los Angeles will recall that this is the 25th anniversary of the first successful airplane flight. The event will be celebrated during the national air races as a tribute to Orville and Wilbur Wright.

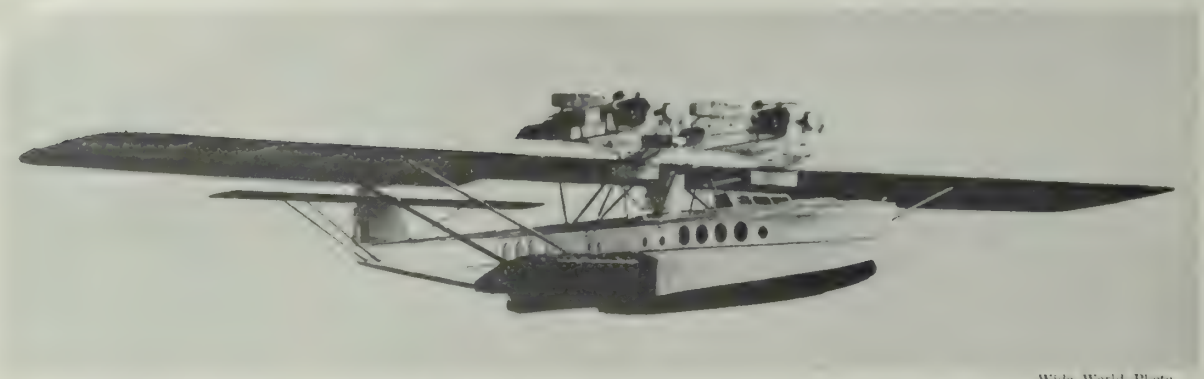
Speed, distance, altitude and endurance records will be sought by the world famous pilots. The United States navy will have 300 planes at the races and will have them all in the air at one time on Navy Day. The United States army will have its fastest planes and every available crack pilot. The service flyers will give exhibitions of bombing, dog fights, formation flying air drills and maneuvers and will thrill the sport fans in their efforts to establish the world's parachute jump record.

The International Aeronautical Exposition will be held inside the grounds and will be an integral part of the air race meet. Exhibitors from all parts of the world will display the last word in airplane building, new type motors and modern aircraft accessories.

The officers and executive committee of the California Air Race Association are:

President—Theodore T. Hull of Derthick & Hull, attorneys, and president of the American Aircraft Corpn.

Vice president — Harry H. Wetzel, vice president of the



Wide World Photo

The Huge Dornier-Napier Metal Flying Boat Just Built at Lake Constance, Germany; 2,000 Horsepower, and Will Carry 20 Passengers and a Crew of Three.

Douglas Aircraft Corporation.

Secretary-treasurer—D. E. McDaneld, president of the Southern California Chapter of the National Aeronautical Association and president of the Packard Motor Car Co., Pasadena.

Executive committee members with the foregoing: Dr. T. C. Young, Robert J. Pritchard and Dudley M. Steele.

Cliff Henderson is managing director of both the National Air Races and the International Aeronautical Exposition.

Realizing what the next few years will mean to Southern California if the aircraft industry makes Los Angeles its manufacturing and distributing headquarters, the business men of the state are backing the national air races. Just a few of the men on the advisory committee of the national air races are:

J. H. Cheek, vice president of the Cheek-Niel Coffee Company; Harry H. Culver, president Harry H. Culver Company; Bernal H. Dyas, president B. H. Dyas Corporation; George L. Eastman, president Los Angeles Chamber of Commerce; Abe Frank, vice president Ambassador Hotel; William May Garland of W. M. Garland & Co.; Harris M. Hanshue, president Western Air Express; Wilbur May, treasurer the May Company; Harry H. Merrick, H. H. Merrick & Co.; W. W. Mines, president Mines & MacKeigan & Anderson; D. W. Pontius, vice president and general manager Pacific Electric Railway Company; James B. Duffy, general passenger agent Santa Fe Railway; Paul Shoup, executive vice president Southern Pacific Railway; W. L. Stewart, Jr., Union Oil Company, and James Woods vice president and managing director Los Angeles Biltmore.

The People Are Growing Air-minded

People do seem to be growing air-minded. A few, of course, are frightened by reports of fatalities almost daily in airplane crashes, neglecting to note, doubtless, that these with scarcely an exception are students. Trustworthy pilots in the air mail and passenger and express business take no more chances than the engineman at the head of a railroad train.

Passenger traffic continues to grow. March air mail figures released by the Boeing Air Transport Company were 51,000 pounds, compared with 44,100 in the preceding month. At the present time planes in air mail service in the country travel 15,000 miles daily, 6000 miles of which are flown by planes of Pacific Coast origin. By July 1, it is predicted, mileage will have increased to 25,000 daily.

Eastbound mail carried by the Boeing company during the week ended April 19 totaled 1856 pounds, an increase of about 20 pounds. Passengers totaled 20 both ways. Mail carried during the week by the Pacific Air Transport, operating on the coast only, was slightly smaller at 1845 pounds. Eighteen passengers were carried. Express on the combined routes amounted to 160 pounds.

During the period beginning January 16 and ending April 1, Pan-American Airways, Inc. of New York, carried 607 passengers on their line between Key West and Havana, an average of 250 a month. The line also carried 132,000 pounds of mail during the period, with a saving in time of a full day. This would indicate that even without subsidy as is given European companies, American air lines are proving a success.

Reports from the Wright Aeronautical Corpn. state that a program of factory expansion costing $3,500,000 is planned by the company at its Paterson, N. J., properties. Included in the plan are new building and equipment. The company states that additions have been made necessary by increased orders. Completion of a new assembly plant will permit a monthly output of 180 airplane engines compared with about 90 at the beginning of the year.

Following up its recent decision to extend its mail and express routes to Detroit, National Air Transport plans service as far as Tulsa, the line to be extended

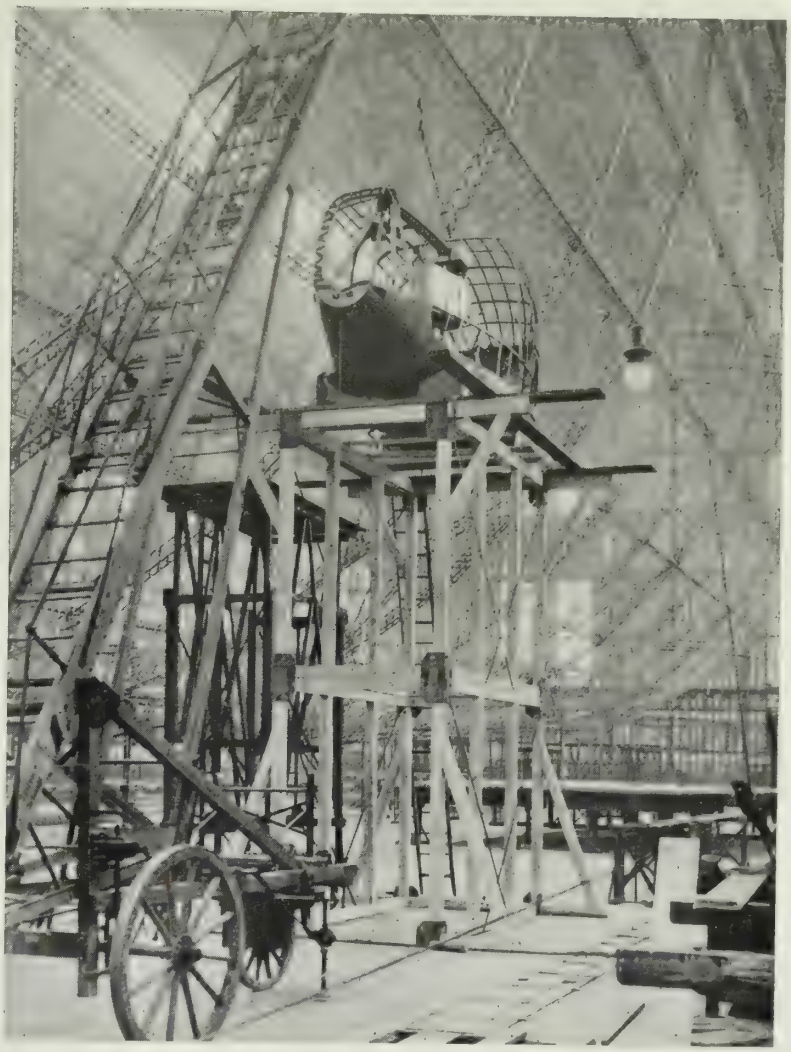
from Ponca City. This company was formed early in 1925 with a capital of $10,000,000 and was one of the first air lines to operate successfully after the post-war depression in the industry.

An attempt to set a new endurance record will be made during May if plans of the Fairchild Corporation materialize. At the present time the company is preparing a plane for the test. The plane is one of the companies regular commercial cabin monoplanes equipped with a four-cylinder air-cooled Fairchild-Caminez motor, which has no crank shaft and develops 135 horse power.

The National Park Airways has ordered six Wasp motored Fokker planes for the purpose of arranging trips to leading scenic resorts of the country. The proposed line is intended to start at Salt Lake and from there will pass over Yellowstone Park, Ranier National, along the Columbia river highway, to Crater Lake Park, Yosemite, the Grand Canyon and back to Salt Lake by way of Zion National Park.

Western Air Express Inc., mail planes, operating between Pueblo, Colorado Springs, Denver and Cheyenne, will carry passengers and connect at Cheyenne with the transcontinental mail and passenger route, starting May 1.

The service will provide for flight from Los Angeles to Salt Lake City on Western Air Express mail planes, then on Boeing Air Transport planes to Cheyenne, and on Western Air planes through Denver, Colorado Springs and Pueblo.



This Wide World Photograph Shows the Dangerous Scaffolds on Which German Workmen Operate in Building a Dirigible at Friedrichshafen. This Big Ship Will Have a Crew of 26, Drawing Room, Electric Kitchen, and Ten Cabins With Two Berths in Each.

Air Lines To Be Expanded

By June 15 the West Coast Air Transport Co. of Portland, Ore., will have a line into Los Angeles; one into El Paso and Dallas by August 1, and if they can obtain the planes, will have lines to Kansas City, St. Louis and Chicago by November 1.

At present the company runs two round trips a day, 20 miles each way between Portland and Seattle, and a one-way-a-day trip between Portland and San Francisco. By June 15 the latter will be on a daily schedule. A direct line will be opened between Los Angeles and Seattle, taking nine hours, and another line from here to Chicago via El Paso, Tulsa and Kansas City in twenty-one hours, by the first of the year.

The West Coast Air Transport Co. is closely affiliated with the Pickwick Stage System and will follow the Pickwick routes over the country. The Bach trimotored cabin planes are now being used, carrying one pilot one mechanic and eight passengers. By fall they will have planes to carry 20 passengers

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The Western Canada Airways, Ltd., at Winnipeg reports that during the year, seven of its planes carried 1,200 passengers and 290,000 pounds of express baggage, and that up to November 30, 1927, the planes had covered 154,000 miles. The airplanes now in the service of the Western Canada Airways, Ltd., include three Fokker monoplanse, two Fairchild four passenger monoplanes, and two De Haviland "Moths." Twelve new Fokker monoplanes have been ordered for delivery this year.

The S. P. Motor Buses

A statement issued by T. B. Wilson, vice president and manager of the Southern Pacific Motor Transport Co., a Southern Pacific subsidiary, shows that in four months of highway operation, October 1, 1927, to January 31, 1928, the company's coaches traveled 386,683 miles and carried 78,412 passengers.

The Southern Pacific began last fall to use motor transportation as a supplement to its rail service in Oregon and California, and is the sixty-second railroad in the United States to adopt this form of operating economy, as well as increased public service. The motor bus operations of the company at present are as follows: In Oregon: Portland to Ashland and intermediate points; Portland to Forest Grove and intermediate points; Portland to Corvallis via McMinnville and intermediate points; Portland to Cook and intermediate points. In California: Santa Cruz to Boulder Creek and intermediate points; Napa to Santa Rosa and intermediate points. This latter line was taken over by Southern Pacific Motor Transport Co. on January 1, 1928, and operates through the Valley of the Moon made famous by Jack London.

The Southern Pacific's interstate motor bus operations extend from Reno, Nev., to Truckee, Cal., from Grants Pass, Ore., to Eureka, Cal., and from Medford, Ore., to Weed, Cal.

The Southern Pacific Motor Transport Co. now operates 49 coaches which number includes ten coaches used in street car service at Eugene, Ore., and 16 in the same service at Salem, Ore. Three service cars and one inspection car used in the Oregon service brings the total of motor units operated by the company to 53. Of this number six of the motor coaches are used in California, the remainder in Oregon.

Applications for permits to substitute motor coaches for rail transportation in several parts of California are now pending before the California state railroad commission. The commission recently granted the Southern Pacific's application to institute seasonal service from Truckee to Tahoe, Cal., on the shores of the famous Lake Tahoe, noted summer and winter resort of the Sierra Nevada.

"The success of coordinated motor coach and rail service to date," said Mr. Wilson, "has been very encouraging with better prospects for the future. While there is no way of identifying increased earnings of through trains because of the coordinated motor coach service, it is a well known fact from individual cases coming to our attention that motor coach service is feeding considerable patronage to through trains."

Bad Order Carding System

By O. O. Carr

The average freight car has a gross earning capacity of about $6 a day. At current purchase price of new cars and cost to maintain, it costs about $1.18 a day to own and maintain the average car. About 73 cents of this daily expense or the cost of ownership, above costs of repairs, takes place whether the car is idle or in service, hence the importance of those on the ground giving the bad order car subject more than passing consideration. When the number held for repairs on a large railroad exceeds a reasonable minimum this loss during times when every available car is needed may mean a great loss.

A good carding system affords an index as to promptness and more systematic handling. An inspector's book of blank forms provided with permanent pages with a corresponding form page on paper of another color, made detachable by perforations, serves as a carbon copy of the original or permanent record and delivered to yardmasters indicating date, hour, nature of defects and other information corresponding with the cards tacked on the car, gives the yardmaster all the information needed to handle with the minimum amount of switching.

A series of car cards for tacking on bad order cars on which are printed 60 blank squares (for inspector to insert pencil mark cross) opposite one or more of the 60 kinds of defects listed and printed thereon, makes a convenient form for inspectors to fill out. These cards, being reversible, serve a double purpose. They not only keep the number of cards to be carried by the inspectors down to the minimum, but also the number of forms carried in stationary department stock. The names of defects classed as "safety appliance defects" printed on these cards in red ink (a different color from other printed defects) indicate the nature of the bad order, which, in itself, carries with it "safety first" information valuable to switchmen and others handling such cars. Of these cards there should be one for bad order loaded car, reverse side for empty cars; another for transfer load, reverse side for empty car; another for heavy shop repair when empty, reverse side for empty car; another for car to be placed in rear of train, directly ahead of caboose, reverse side for cars that are to be returned to connecting lines for repairs; another for empty car inspected for fruit and vegetable loading, with instructions on bottom to agent at destination to detach and file to serve as a claim prevention record; another card for good grain cars, (instructions on bottom to agent at destination to detach and file to serve as a claim prevention record), the reverse side for cars fit only for rough freight loading.

Bad order cars requiring minor repairs should be set on a track apart from heavy repair cars, so these can be switched out oftener than once in 24 hours.

It Isn't All Red Tape, He Says

The Intricate L. C. L. Account

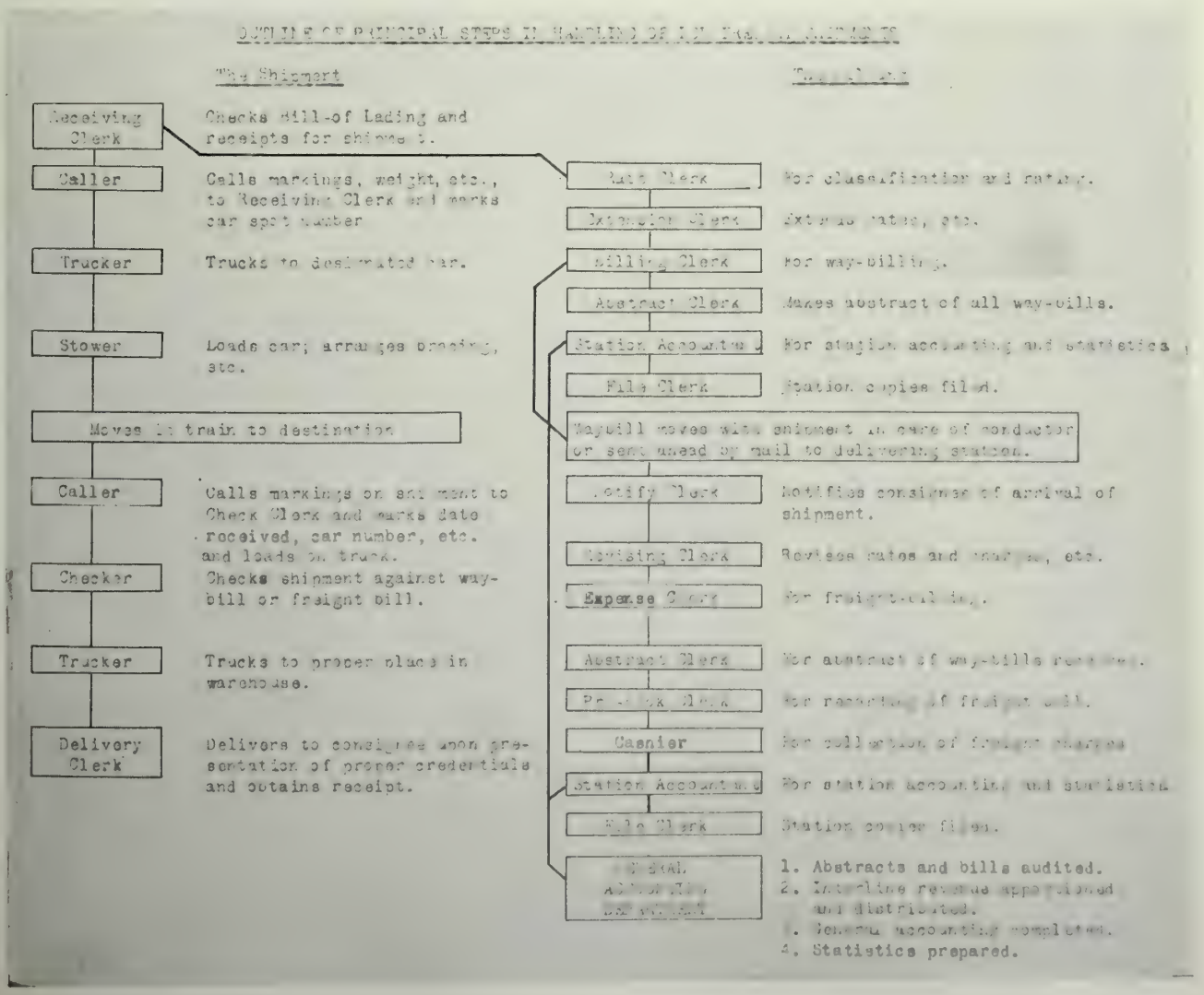
By Max Winkel

AT LEAST twenty-five persons are directly concerned with every less-than-carload shipment moving over a railroad. That is to say they come in actual contact with the shipment or the billing. As many more are indirectly involved, either in a supervisory capacity or in moving the shipments in bulk. The agent, division superintendent, car service agent, and perhaps the general superintendent, confer on the schedule of the merchandise cars, and constantly supervise and check the traffic, rearranging the schedules when necessary to meet requirements.

The warehouse foreman supervises the spotting and loading of cars; the car clerk orders the cars; a yard clerk cards them for the house; a switch crew sets them in, pulls them out and makes up the train. In the train they move to their various destinations where another switch crew again sets them in at the house for unloading.

And in between there are messengers, inspectors and clerks, checking, inspecting, and recording every step of the process, and piling up statistics. Next to a laundry, perhaps, no business has more small and intricate details than railroading where these less than carload items are concerned. So intricate is the system that a good many normal persons cry "red tape" at the railroads, but without suggesting a simpler method of handling the business.

Few of the objectors have any real understanding of the tremen-



dous amount of detail involved in the transportation of freight. I have tried to show, in the accompanying diagram, the handling of a small shipment, commonly called an l.c.l. shipment, from the time it is received from the shipper until delivered to the consignee. The method of handling might vary slightly on different railroads and in different stations but the general procedure is about the same. This outline covers the movement of a shipment from one station directly to another. Quite often, however, a transfer from one car to another is necessary on account of the routing, especially if the shipment moves over more than one railroad, thus adding several more steps in handling, as the package must be handled and checked in and out of each car and more records made. And if, as sometimes happens, the shipment and billing become separated, or either goes astray, then the steps necessary to reunite them and get the shipment to its destination are complicated indeed.

When we consider that an error by any one of the persons involved is likely to damage or lose the shipment, and remember that only an infinitesimal fraction of the freight shipped does not reach its destination, we begin to appreciate the efficiency of the railroads' personnel. Every employe in a freight house handles hundreds of shipments in the course of a day's work, and the number of errors is so small as to be almost negligible. Furthermore, the shipments handled are as varied as they are numerous. Seldom are there any two alike in size, weight, construction or contents. Packages, boxes, sacks, crates, bales and cans come in a never-ending stream. They may contain anything from soup to dynamite. Many articles require special attention. Fruit, butter and other perishable commodities require icing in summer and protection from cold in winter. Glassware and similar articles must be protected from breakage, and explosives and combustibles must be handled with extreme care under all circumstances.

The rates charged for handling these l.c.l. shipments sometimes appear to be ridiculously small, in comparison with the service requirements. The minimum charge is 50 cents, but in many cases a shipment of 200 or 300 pounds will be transported for this amount. In some instances the revenue does not nearly cover the actual cost of service; in fact, many railroad officers maintain that all l.c.l. service is operated at a loss. Cost accounting is almost impossible in railroad operation, however, so the actual results of any single department's operation is wholly a matter of conjecture. The rate structure is supposed to be based on what the traffic will bear, just as a merchant sells his goods for whatever price the demand will justify, knowing that some articles are handled at a loss but content if his operations show a profit for the whole.

The complex handling of l.c.l. freight is typical of all other departments of railroad work. Almost every operation, whether of maintenance, operation, traffic or accounting passes through a myriad of hands before being completed. But this, in itself, is not proof of the existence of red tape. In reality it is a refined application of the same system so much advertised by its use in the Ford plants, and now used by thousands of manufacturers all over the country. The only difference is that on a railroad every employe performs not only one operation in a series, but he also forms a link in a hundred other series as well. Because of its ramifications the efficiency of this system is not so apparent in railroad operations as it is in the building of automobiles, but it is so well organized that the cost of transportation in the United States is lower than in any other part of the world.

That this system can and will be improved upon is beyond question. Only an optimist would concede that we have reached a state of perfection, and no one but a confirmed pessimist could doubt that we will go on making improvements. But when these improvements come the laugh may be on the "red tape" opponents. Instead of simplifying the present system we may find that greater efficiency can be secured by making it more complex. Who knows?

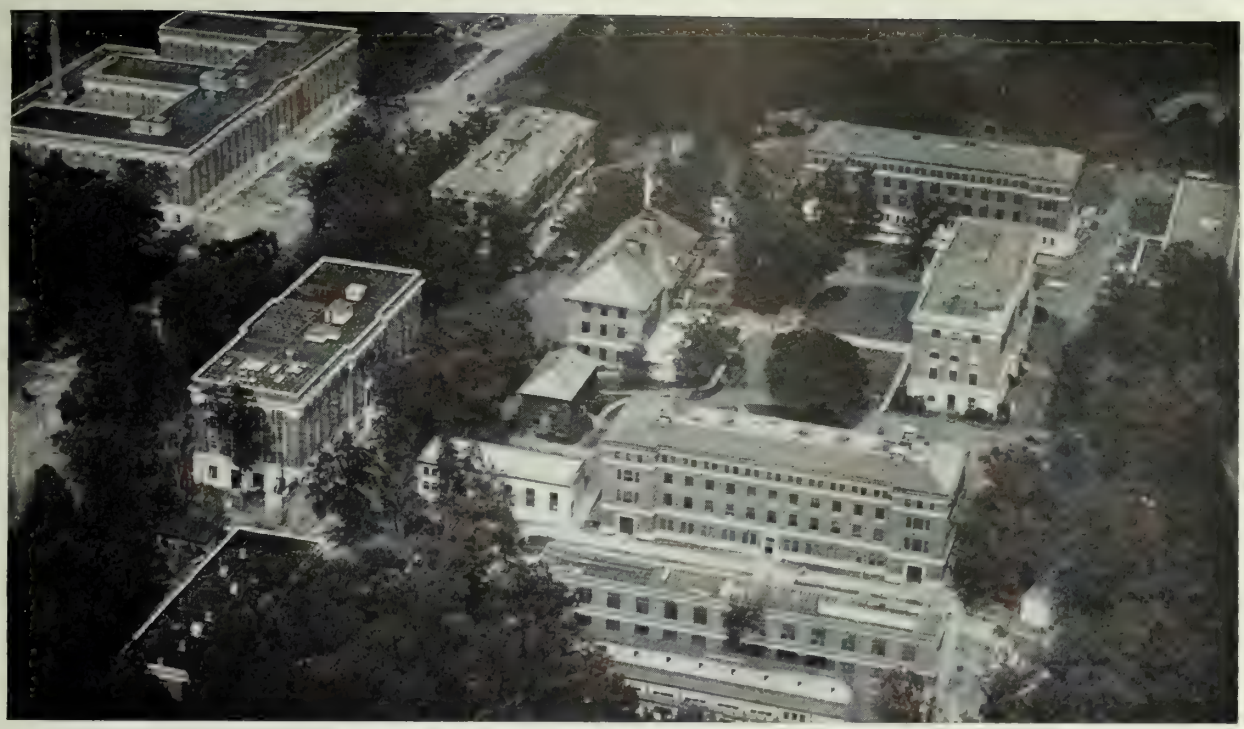
Business Conditions Improve

The improvement in business conditions in April, May and June of this year compared with the same months of 1927, will be much greater in the Mid-West than in other sections of the country, according to a compilation just made of the reports of the commodity committee making up the Mid-West Shippers' Advisory Board at Chicago. This board includes in its territory Illinois, Iowa and Wisconsin, northern Michigan and western Indiana.

According to reports of this board, business in this territory in the second quarter of the year will show an increase of 12.7 per cent over the corresponding months a year ago, while for the country as a whole an increase of but 3.7 per cent in business activity is indicated by the combined reports of all of the shippers' advisory boards. The expected increase in Mid-West activity is greater than that predicted for any other section of the country, the next highest figure, amounting to 10.7 per cent increase, being reported for the Allegheny region centering at Pittsburgh.

The Air Service Grows

The Commercial Airplane Transport Co. has been organized to carry mail, freight and passengers between Calgary and Edmonton, Can., 200 miles. One lighter plane will fly over the mountains between Banff and Lake Louise.



You've Heard of the Bureau of Standards in Washington? This Is It. It's the National Information Office in Scientific Matters Affecting Human Health, Comfort and Convenience.

Why Does Your Tire Wear in Spots?

Ask the Bureau of Standards

By U. V. Wilcox

WHAT makes the tire tread wear out in spots?

What form or design of balloon tread is the best for truck or bus?

Does the dust of the road affect the motor?

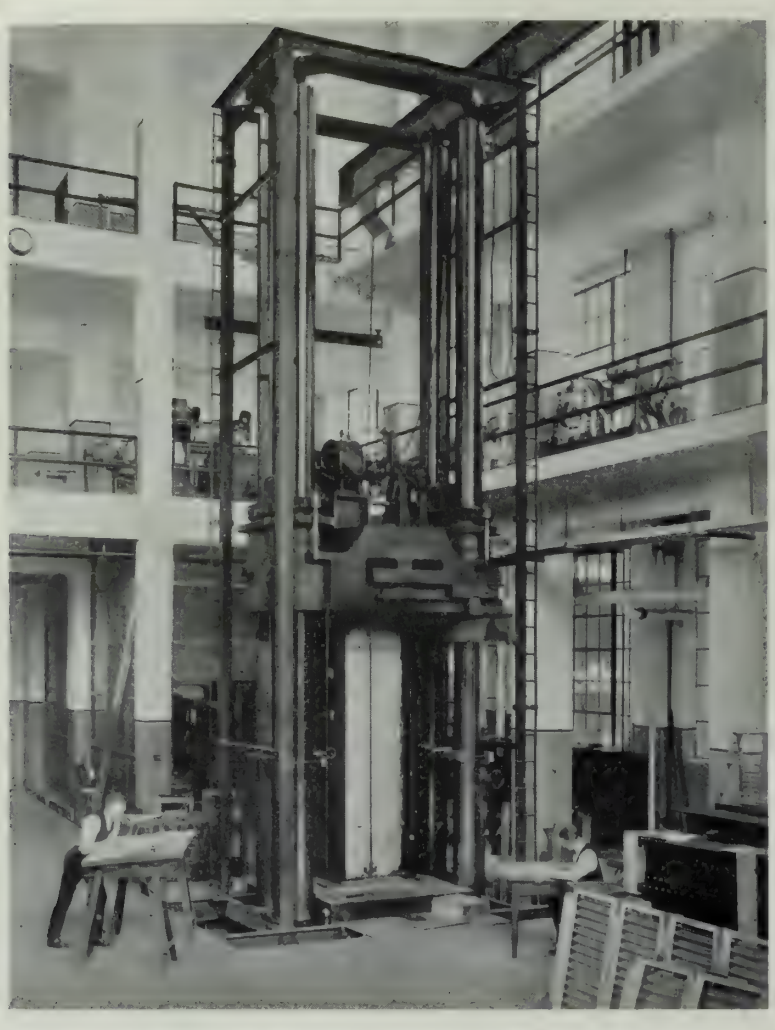
Will a warm radiator help in starting on a cold morning?

What is the best headlight beam?

These and many other equally important and troublesome problems are being studied by scientists in the bureau of standards at Washington, an institution well known to technical men, but much of a mystery, perhaps, to most of the population. Of course not all the problems are solved immediately but eventually they are, and when this happens every manufacturer and operator of bus and truck gains the benefit of the latest engineering skill and advice. The bureau of standards—a part of the department of commerce—is not serving one manufacturer or any one owner at the expense of others. The results of these studies made by federal scientists mean, of course the distinct improvement of all trucks, buses and all motor transportation whose operators and makers are keeping abreast of such technical matters. The ultimate benefit is for better equipment at lower costs.

Take the matter of tires: If there is one problem more than another that the truck and bus operator is concerned over it is the wear on his tires. At the same time probably he abuses them the most. Watching through clear plate glass with both the naked eye and the photographic camera, the bureau of standards is experimenting with a specially constructed apparatus to determine how and why the treads of the heavy service tires wear, and the effect of the axleload and air pressures. The apparatus, devised to show by intimate observations the varying configurations in tire treads for the information of the transportation industry, includes a miniature motor truck or chassis that is moved back and forth on a rack and pinion, with tire pressing against the glass plate at varying pressures and loads.

In explanation of their work the scientists say: "A tire is constructed with a thick layer of rubber around its outer circumference to act as a wearing surface. This is referred to commonly as the tread of the tire as distinguished from the body which is designed to withstand the air pressure. The



Usually We Side-Step Superlatives, But This Time We Must Report the Facts. This Is Said to Be the Largest Testing Machine in the World. Capacity Ten Million Pounds in Compression.

ideal tread, in addition to giving tractive properties to the tire, should wear down uniformly, and at such a rate that it will last as long as the remainder of the tire.

"From an observation of the way in which treads wear in surface as well as from laboratory tests, it is apparent that the wear is influenced by the construction of the tire and the design of the tread as well as the external conditions such as road surface, speed of operation, and so forth.

"The fact that the wear of a tire tread is influenced by the design of the tire has been emphasized by the general adoption of the heavy service balloon and cord tire which, because of its large contact area, subjects the tread to greater distortions as it comes in contact with the road than is usual in high pressure tires.

"Abnormally rapid wear of tires, often in certain spots, is not uncommon and many different steps have been taken by manufacturers to overcome the condition. There is talk of flat treads and round treads, wide and narrow treads, and observations will show many different configurations, all of which are designed, to some extent perhaps, to overcome abnormally rapid tread wear.

"We have built an apparatus consisting of a chassis of a truck, which may be moved back and forth on a track by rack and pinion. The body of the car consists of a sheet of clear plate glass. A tire under definite load and air pressure may be pressed against this glass plate and observed through the glass. By running the car along the track while the tire is pressed against it the distortions of the tread corresponding to the action in service can be seen and photographed and the variations studied.

"The tendencies of different parts of the tread to slide when in contact can be noted and the effect of alterations in the tread shape and design studied. This investigation is yielding valuable information as to just how and why treads wear, how the wear is affected by axle loads and air pressures and the general characteristics of a tire for minimum tread wear."

These tests will be continued indefinitely. The bureau has summed up certain general suggestions as to tire wear and care. Some of these are well known to every truck operator and bus owner, and some are new:

Keep your "shoes" properly inflated.

Do not run a "flat" further than is absolutely necessary.

See that all wheels are in correct alignment.

Remember that oil, grease, sunlight and heat are enemies of rubber.

Spare tubes should be carried in wrapped packages, whether underneath truck body or in back of the bus.

Avoid the use of bent or rusty rims.

If chains are necessary, apply them loosely.

Have cuts in pneumatic tires promptly repaired.

Adjust brakes so they operate evenly on all wheels.

Drive carefully and avoid bumps, particularly at high speeds.

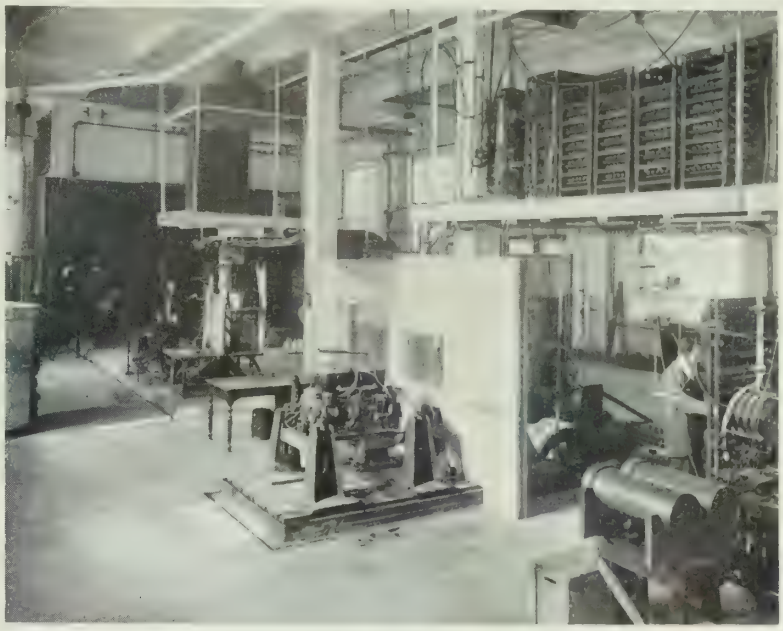
The Firestone Rubber Co. has been using C. Francis Jenkins's high speed camera in a study of tire wear. This is a super-speed camera and its use in a study of tire wear is evidence of the lengths that manufacturers are willing to go to improve their product. The Firestone laboratories have sought to determine what happened in a tire traveling at a high rate of speed under varying conditions including road uneveness, bumps, and so forth. No camera previously has been able to give distinct pictures. Mr. Jenkins, who is well

known in the radio and aircraft field, went to the Firestone laboratories, and within a short time had "shot" a number of reels of film. From the results obtained it is expected that important information will be obtained for the further improvement of the tires used on trucks and in the automotive transportation field.

This camera was trained on a truck wheel running at 20 miles an hour under various load conditions and over an uneven wheel having observations similar to road conditions. Both the solid rubber and the balloon tire was observed.

Where the ordinary motion picture camera makes use of but a single lens and makes exposures upon an intermittently moving film, the Jenkins camera uses 48 matched lenses and the film moves continuously. The lenses in this camera are set in a disc which is rotated by an electric motor. The motor also operates the mechanism driving the film past a fixed shutter opening. The continuous exposures and the arrangement of the lenses enabled Mr. Jenkins to get more than 25 times the amount of exposure possible with other high speed cameras.

In a view of the results of the film specially made for this correspondent, the action of bounding and rebounding of the tires and their expansion sideways and internally could be watched. The effect of this punishment could be observed in the minute cracks in the rubber and the general wear. This film subjected to careful study is expected to give tire engineers fresh information that will result in direct benefit to truck owners, drivers and bus operators.



Interior of the Dynamometer Laboratory, Bureau of Standards, Where Many Engine Troubles Are Studied. Note, in Center, the Large Truck Motor, and Glass Partition At Side for Special Observation.

Every operator knows that hot and cold weather affects the efficiency of his brakes. Perhaps some one has noticed that after the brakes were tightened they grabbed quickly after running a short distance, due to the swelling of the material under the heat of the friction. Federal scientists of the bureau of standards have learned there is a pronounced decrease in the coefficient of friction when the linings are operated under test conditions which cause a rapid increase of temperature of several hundred degrees. Its tests in brake efficiency have developed a simple and accurate type of indicating accelerometer for testing the braking efficiency of all automotive transportation. More than a thousand are in use throughout the country while in cooperation with engineering societies a uniform brake safety code has been drawn up. This code has been adopted generally by many states and probably will become a national standard.

Several months ago the bureau undertook a study of the effect of road dust on bearings and on cylinder walls mixing with the oil in the crankcase a fine abrasive. Under severe operation conditions road dust in the lubricant was found to increase friction losses considerably while with very light loads but little difference was noted. The journal bearing friction machine used in the tests provided a method of measuring frictional loss in a bearing when operating under different conditions of load, speed of shaft, viscosity of oil; by correlating

Here's the Test Car Used by the Bureau of Standards for Checking Up Railway Scales.

—International Newsreel.

Alderman Jagoe of Brooklyn Drove Up to the New York City Hall Recently in This Rig, and It Took the Police Reserves to Control the Mob That Gathered.

these facts in a suitable manner a comparison of the performance of different lubricants with a given bearing was obtained.

Without doubt this study will be productive of much good in the maintenance of good equipment for motor transportation, particularly trucks and buses covering long distances at comparatively high rates of speed.

It has been noted that under severe operating conditions the friction when operating with an abrasive in the oil (similar to dust) was found to be far greater than when operating with a straight oil, the difference in friction increasing as the severity of operating condition increased. It is evident, according to these scientists, that definite results in journal friction wear will bring about improvements in manufacture.

It has been established as a fact that road dust is one of the finest abrasives ever discovered, and nothing so contributes to piston wear and slaps as that dust mixes with the oil and gasoline.

Those Motor Vehicles

Out of 29,600,000 motor vehicles in the world, America has 23,253,882. Aside from America, Great Britain is the only country in the world that has more than one million motor vehicles, and she has but 1,219,477. France and Canada are next, each having a little more than 900,000 motor vehicles. In the United States there is one automobile for every 5.1 persons.

Start Your Own Bus Line

Motor clubs are giving officials of Australia, which owns the railways of the country, a new problem. The clubs are composed of suburbanites of Melbourne who join together, pay an entrance fee and subscription, and the club buys a motor omnibus. Each club's membership is limited and only members may use the buses that ply between each suburb and the city. The buses therefore do not "ply for hire," but "carry their owners," and thus avoid the bus tax. They have caught the suburbanites' fancy to such an extent that the minister of railways is complaining of the growing competition, which he says is no more than an evasion of the law.

Now, If They'll Just Listen

The language of locomotives blossomed out with a brand new 'word' April 1. Geo. McCormick, the Southern Pacific's general superintendent of motive power, says "To-o-oot, toot-toot, to-o-oot" is the word, and it will signify to motorists, pedestrians and others the highways that a train is approaching a grade crossing.

Hitherto locomotives approaching grade crossings have sounded two long and two short whistle blasts, but this is now to be changed to one long, two short and a final long sounding of the whistle.

Ben Hur Stunt

Frank McKee, of the McKee-Lewis Motor Company, of Versailles, returned from Detroit yesterday. He drove back five new Chryslers.—Lexington Herald.

Worth Remembering

A train going 40 miles an hour requires 1320 feet in which to stop, whereas an automobile can be stopped in 93 feet at the same speed.

Directors of railroads in Great Britain average more then 60 years of age. The average ages of the directorates of the four great transportation systems are: Southern railway, 67; Great Western, 62; London North Eastern 62; and London, Midland and Scottish, 60.

Just Like a Girl

When Elizabeth B. Patterson, Smith College student at Northampton, Mass., got her weight down to 103 pounds she decided to go to her home in Santa Barbara Cal., by air mail. Postoffice gentlemen complimented her for her wit, ingenuity, nerve, but turned down her offer of $300 and reminded her the air mail fare for such a trip is $1,000 for 103 pounds, one way. So Elizabeth for once changed her mind in favor of the slower but cheaper railroads.

Editorial Comment

June Days At Atlantic City

WHEN this issue reaches the readers it will be time for those who have not already done so to buy the annual straw hat, see the tailor about a new suit, or investigate solemnly the possibilities of making the old hand-me-down do for one more trip. It will be time, too, to shake the moth balls out of the evening clothes, gaze at them a bit ruefully, and wonder whether it won't be possible to let out the seams once more to allow for the increase in waist-line since the golf season closed — if the faithful reader lives in that kind of country. After long deliberation enlivened, perhaps, by a few caustic remarks from the missus to the effect that men's styles don't change much, after all, the reader poses before the mirror, unable to note the changes the years have made, and decides for himself that he does not look at all like the head waiter at the Biltmore.

You may have noticed, if you attend church occasionally, that notwithstanding the fact that all the announcements have been printed on the calendar and distributed to the faithful, the minister reads every one of them to his flock. Acting upon the same reasoning here it is proper to say that reservations should be made now for the big band wagon that takes you to Atlantic City next month for the various meetings of the American Railway Association. Division V, Mechanical, will open its annual meeting June 20. Division VI, Purchases and Stores, is to start its deliberations the next day, June 21. The new Motor Transport Section also will hold sessions in Atlantic City this year. All in all the late days of June are likely to witness the greatest gathering of railroad men ever assembled in one place in the history of transportation, an occasion no railroad man should miss.

During these conventions, Transportation will maintain headquarters at Space 717 in the new Aishton Hall, adjoining the Million Dollar Pier. These facilities are entirely for the use of our readers, and they are cordially invited to make this their headquarters, to rest their weary "dogs," or consider in friendly discourse, the aspect of things in general, the welfare of the country at large and the progress and prosperity of railroads and the things of which they are made. Remember the date and the place: June 20, Atlantic City, Space 717 in Aishton Hall.

A Dollar or Two a Week Will Do

It is possible now to buy almost anything under the sun on the installment plan—anything except a railroad ticket. It can be done in Great Britain where there are only four great railway systems, (and this may be a good argument for consolidations) but it can't be done in the United States.

Why? The first reason given by a passenger official was "there would be so many accounts to keep." Can you beat that? The second gent said the scheme wouldn't work over here. It may work all right in England, which is so small you could lose it in Cherry County, Nebraska, but not over here. He was too busy to be specific but the idea was just a washout.

In London theater seats may be reserved six weeks in advance and paid for in installments of 25 cents a week. A vacation railroad ticket may be purchased the same way, the amount, of course, being larger, and it is believed passenger revenues can be very largely increased as a result.

Why wouldn't the idea be popular over here? A great many untraveled and uninformed persons are appalled every year and dismayed over the price of a railroad ticket to the old home. The fact that this ticket will, in very many cases, be the cheapest thing the vacationist buys during the summer trip is not apparent, but it ought to be, and through the easy payment plan could be made almost inconsequential.

If banks, already having thousands of small accounts can afford to establish Christmas Clubs, why can't railroads lead men and women in the same way to save money for tickets back east or wherever they care to go? Of course the idea might be a flop in California or Florida where everyone is on a perpetual vacation any way, but there are several other states— 46 others according to the morning papers —and no human beings on earth travel so much or hope to travel so much as do Americans. They already are well educated in installment buying. Once let them know that A Dollar or Two A Week Will Do for A Trip On A Railroad Train it may take the police to keep the sidewalks clear.

No Joy in College Life

Dean Walden, in charge of freshmen at Yale, asked the faculty, recently to forbid first year students using airplanes. Princeton already has such a rule. The average college faculty is most cheerful when interfering in some way with the student's pursuit of happiness which most of us suppose to be our national heritage. Of course the constitutional guarantee, at least in college, does not extend to the freshman.

Why can not these profs realize that these young

men are trying to do their part in advancing the progress of transportation? Only a few years ago some colleges would not permit students to use motor cars on the campus. Now airplanes are banned. How, may we inquire, are these students to go to college? Do the profs think they should walk or ride the street cars? Why go to college?

Ride 'Em or Lose 'Em

If the public won't use railroad trains—except in bad weather—the trains should be discontinued. Under the same display heading used on this editorial the Nashville, Chattanooga & St. Louis Ry., runs a two-column advertisement in the Atlanta Constitution setting forth some pertinent information, right to the point,

"Six years ago," says this advertisement, "almost four and one-half million rides were purchased by passengers on this railway. Last year the number was less than two million. In the same period passenger train service actually increased. Many passenger trains are now operated at a loss, while the people who once depended upon them have found other means of conveyance.

"This railway has been slow to reduce its service so long as it paid actual expenses, hoping that local travel would return to it because of greater comfort and safety.

"Railroad passenger rates are as low as those at which any other public carrier can permanently furnish dependable service, and are much less than the per mile cost of running a private automobile when all the elements of expense are considered.

"The railway does not desire to curtail or abandon its passenger service, but good business requires that such service shall be no greater than the demand for its use. The railway cannot continue to furnish an unprofitable stand-by service to be used merely when other agencies fail.

"It is our hope that the railroad may again carry enough passengers to justify its present local service. If not, service must be reduced.

"These facts are laid before our patrons that they may understand the reasons for any changes we may later be compelled to make."

The entire announcement is reproduced for the information of other railroads.

What Do You Mean, Old?

When Secretary James J. Davis was a boy which, of course isn't so very long ago, a worker who had reached the age of 50 was discharged. The company gave him a watch and a blue ticket and sent him home.

The secretary talked about such things, not long ago, before the fifteenth annual banquet of the Westinghouse Electric & Mfg. Company's Veteran Employes' Association at Pittsburgh. Some of his opinions will be comforting to men of 50 or 60 who are tottering feebly along toward their graves, mumbling to themselves.

"When I was a boy," said the secretary, "working in an iron mill, I saw many a faithful worker forced into retirement at 50. Since then science has added years to the span of human life. Today nobody feels old at any age. Instead of becoming a liability at 50 or 60, the intelligent worker is all the more an asset to the concern that employs him. The finest brain and the strongest brawn never can outwit experience. The veteran employe always is worthy of his hire."

Some Facts About Whistling

Statisticians are all worked up over some of the so-called crazy figures used in describing the cost of blowing a locomotive whistle. Articles in railroad magazines from time to time have discussed this subject at length, some angrily and others in good humor, but none, apparently with any reasonable regard for the out-and-out facts of the case. One of these facts is that whistling ordinarily costs much less than some of us have believed who have not found our chief joy in such figures.

It appears from the record that whistling, like many other things in this unstable world, has changed mightily since the days of horse-drawn vehicles. We hadn't noticed it. One locomotive whistle has always been pretty much like another to us at 2 o'clock in the morning regardless of the cost, but the highest authority necessary informs us solemnly that we are mistaken. We seem to have heard this before. In what one delightfully serious correspondent calls the "good old days of horses" an engineman could whistle — meaning, doubtless, the locomotive—in an orderly way, in accordance with the code, and give all the warning anyone on earth would need to avoid being distributed about over the surrounding landscape.

But now, says our serious friend with the figures, the reckless foolhardiness of automobilists trying to get to the crossing ahead of the train makes it necessary for the engineman to go quite beyond the old-time code which, he declares, has been shot to pieces along with the engineman's nerves.

No engineman, we are told, should be limited in the use of the whistle. The cost of the disturbance really is infinitesimal. Every time a locomotive whistle is blown for six seconds the company's net return is set back only $0.0005739 which, we are solemnly assured, is about one-twentieth of a cent. In a 100-mile district having 105 country highway crossings and 15 towns in every one of which there is one main street and 25 operating conditions for

which warnings are sounded, that is 160 whistles of six seconds each or 960 whistle-seconds equal to 16 continuous whistle-minutes—something dreadful to contemplate—the cost is only nine cents for the whole 100-mile district, the net return hasn't been seriously mistreated, many lives of great potential value have been saved, provided they obeyed the warnings, and the engineman's nerves are in good order. The statistician goes on to say that if the train averaged 40 miles an hour over this 100-mile district the engineman living up to the schedule set down here, would be required to sound the whistle once in every 1.7 minutes which we should call a fairly well advertised trip.

A still more piquant aspect is given the problem by the writer who says the whistle loss is only about one-fourth of the pop loss as the pops have from 2½ to 3-inch unrestricted opening from the steam dome or boiler, while the average whistle has about 1½ inch opening with the whistle valve inside of this opening. The blowing of the whistle makes no immediate, noticeable change in the steam gauge, while the pop will run the gauge back very quickly. Obviously we should have less popping.

And this, we hope, settles the matter.

Charity Begins At Home

Proof continues to accumulate in court records showing that railroads are and long have been providing suburban service in and out of the great cities without any regard to its cost. This is no longer an idle assertion. It is literally true, and denotes, a rather peculiar public attitude supporting the old theory that everyone wants something for nothing.

Like the dining car service, there isn't a suburban system today in the United States that isn't operated at a loss. When one sees the mobs fighting for a few inches of space in some of the cars morning and evening one finds it difficult to believe that some one isn't making money; but nevertheless it is true. The electrified Illinois Central might run out of the red some day but it will take a long time, and before then only the old fashioned sticks will use such service. Men who are up and coming will fly to and from their business.

Not long ago Dr. John Bauer described as an "expert," testified in New York for the commuters who are battling the New Haven System. Doctor Bauer said that since rates had been increased 40 per cent on that suburban line thousands of the commuters had quit using the trains. What he seemed not to know was that when these disgruntled comuters turned away from the trains they patronized the motor coaches owned, as it chances, by the same company. Doctor Bauer also overlooked the fact that if these Westchester homeowners prefer motor coaches and slower service this is just what they will get. They can not have both coaches and trains. Max Mason, president of Chicago University, said one day at a luncheon that an expert is a man who knows more and more about less and less. Doctor Bauer qualifies.

As Business Sees It

Charles Cason, vice president of the chemical National Bank of New York, and chairman of the public relations commission of the American Bankers' Association, said not long ago:

"With all the restrictions and regulations imposed by the government on railroads, how they do so well and prosper is a mystery to me. Railroad men must be the smartest people in the world and the most patient and long-suffering. Problems they must face and conditions they must deal with change almost overnight. They are constantly confronted with new problems. The motor bus warns them to abandon branch lines or suffer increasing heavy losses. And the Interstate Commerce Commission tells them that they can not do it. While they are being harassed on every side by motor buses the airship glides over the de luxe Pullman trains with a warning and a challenge for a new age of speed and of luxury.

"What can you expect when we have one government employe for every ten taxpayers? Governments are intended to live under, not on."

Those German Railways

Most of the books on government ownership of railroads are out of date, written before the World War or soon afterward, and many of them are valueless at any time. Mark Requa's "The Government and Industry" is worth reading. One chapter alone —the German railways—is worth the price of the book. Most of the books discussing European railways seem to have been written in Kansas or Oklahoma. Requa says:

"Much has been said in the past of the public ownership of railways in Europe. Arguments without end have been made in favor of government ownership in the United States, especially quoting from the German experience. German railways were and are state owned. They were well run prior to the war, but there is no parallel to be drawn between them and what public ownership would be, and might accomplish, in the United States. The reason is simple. German railways were consolidated under state ownership by Bismarck. His object was purely political. The railways were built and operated primarily for the purpose of facilitating German troop movements in time of war. The profits were used to build up the military machine. In short, German railways were part of the German plan of military mobilization. The German government, up to 1918, was to all intents and purposes a military

dictatorship. The people had no important voice in the government, certainly not in the operation of the railways. The railway officials were practically military officers under military discipline. Unions of railway employes were prohibited. Asking permission of the people to perform any act was the last thing thought of. A Prussian state railway official on being asked what would happen if the railway employe's should form a union, replied: 'They would be ordered to their colors. They would then be directed to return to work. If they refused, they would be shot for mutiny.' In France in 1910 the threat of a national railway strike was countered by proclamation for general military mobilization. And the premier who issued the order was a socialist! The conditions are so different from ours that no parallel can be drawn with any justification."

See America First

We gain courage and strength in carrying our burdens by contrasting them with the heavier loads under which our neighbors are bending. If this were not true we might go on, endlessly, submitting to injustices or fancying ourselves ill treated, when the fact is a study of others' conditions would make us feel quite comfortable in contrast. To know that taxes in England are excessive may make our taxes no easier to pay but the knowledge may at least, keep us from wasting much time in grumbling.

We have been accustomed over here to growling, and with what we think is good reason, about taxes imposed upon railroad properties. We complained, and still do, presumably, about high income taxes and war taxes and other kinds of taxes when all the time our cousins across the Atlantic, speaking the same language, save for numerous absurdly misplaced accents and mispronunciations, have been and still are paying taxes that would make an American denounce everything in sight and probably write a letter to his congressman if he could learn his name, and address.

The knowledge that certain high taxes can be collected breeds extravagances in local state and federal government but particularly local and state. Railroads, other public utilities, great mining properties—these carry heavy burdens in taxes imposed by the people who, without being smart enough to know it, finally pay the bill themselves.

Writing recently from England William Peter Hamilton of New York describes the tax burden of Great Britain's four railway systems. "When it is remembered," says he, "that any one of the four systems connecting London with the provinces traverses at least a thousand different parishes, everyone of them making its own valuation assessment and fixing its own rates of taxation it is not difficult to see the problems which arise. Some of the discrepancies are unbelievable. I could furnish scores of examples, but in one parish of Monmouthshire the railway pays just under 90 per cent of the total rates levied; in a parish in Berkshire, 84 per cent; in a parish of Herefordshire more than 83 per cent, while it is hard to find a single parish where the railway does not pay much in excess of one half the total levy."

Mr. Hamilton need not have gone to England for such examples. They are to be found at home in many places and over very much more extended mileage. In the copper range counties of Northern Minnesota—to mention only one instance—90 per cent of all taxes levied are and long have been paid by the mining companies and the railroads. If this were not true do you imagine that sparsely settled regions would have hundreds of miles of concrete highway, and school buildings that would make the taxpayers of New York or Illinois howl loudly about crazy extravagance? One of these schools has a flagpole that cost $8,000. What do you think of this for patriotism?

In numerous middle west and western states there would be no schools if the railroads failed to pay their taxes promptly. Indeed in some New Mexico counties the Santa Fe System paid its taxes in advance to keep schools open. Mr. Hamilton of New York should see America first.

The Costs of Travel Comfort

Every time the passengers spend an hour in the washroom, morning and evening, about two hours a day on a summer-time journey, washing and dressing and otherwise making themselves presentable for train society, about 16 pounds of coal has been used. At $3 a ton this amounts to $0.024 a day for a car. That is to say it takes this much fuel to make the water warm and keep it that way for two hours.

It takes about 34 pounds of coal an hour, .57 pounds a minute, or .855 pounds per car mile at 40 miles an hour with outside temperature of 25 degrees above zero and 70 degrees above inside the car, to warm the cars and maintain the warmth.

Not many operating men have these interesting records down to so fine a point, and while they may not worry over the fact nevertheless such information has its part in the efficiency of railroading. The difference between summer and winter operation costs is more pronounced of course according to geographical location. Cold weather increases machine friction in locomotive bearings and in the journal resistance of cars, the effect being more apparent at slow or starting speeds. The maximum of course is in starting after the train has stood long enough for the lubrication in journal boxes to become cooled off. After this a passenger train has to run several miles before the lubrication in the journal boxes is warmed up again when there

may not be any great difference in winter vs. summer lubrication. It is estimated that this cooling down and reheating process when low speeds prevail, at an average winter temperature of 25 degrees above zero, will increase the resistance of the average locomotive about 5 per cent and on the average train about 15 per cent compared with summer temperatures.

For every pound of coal fired for running consumption of a locomotive it requires about $0.049 (forty-nine thousandths) of a pound, or 4.9 pounds per 100 pounds fired, to operate air pumps, injectors, blowers, bell and other locomotive auxiliaries. A check shows that a locomotive consumes about 13 pounds of coal a minute while standing, when steam must be kept to normal for immediate use, or six pounds when anticipated in advance that the locomotive will stand a considerable time.

The Editorial of This Edition

REPORTS from Wall Street show that the great salt combine earned the interest on its bonds 3.06 times over in 1927. Salt is a public utility in a way. You can't live long without it.

The Earl Fruit Company, and its subsidiaries, leaders in the fruit business, reported for the year ended December 31 last an increase of 189 per cent in earnings. The Earl Fruit Company is a large grower of green fruit and one of the largest commission merchants dealing in deciduous fruits in California.

A very interesting report when one remembers that the Interstate Commerce Commission reduced the rates on eastbound deciduous fruit last winter because of "a very marked economic depression in the fruit industry on the Pacific Coast."

Why not split this 189 per cent with the government 50-50 for all earnings in excess of six per cent as the railroads are required to do?

The annual reports of the big industrial outfits certainly must be interesting reading for railroad executives who have to keep a supply of hooey going into Wall street to encourage stock buying because Gentlemen Prefer Bonds. Bonds, you know, get first crack at the earnings.

Except for taxes these big concerns keep what they earn which, of course, is perfectly proper. No Recapture Clause disturbs their placid slumber. If railroad rates ever should be increased, which is unthinkable of course, up would go the prices of the things these companies manufacture—and this is sound economics. But you can't make the rule work for the railroads. Wheat may go up to $3.15 a bushel, as it did in 1917, but the freight rate will remain unchanged as it did then.

When an annual report shows some railroad favored by traffic density to have a surplus the country's state railroad commissioners begin to froth at the mouth. Mr. Brookhart of Iowa views with alarm and Mr. Capper of Kansas asks for an investigation. But no one throws a fit when Henry Ford's company at Detroit shows a surplus of $654,851,061 as it did December 31, 1927, about three times the surplus of the whole Santa Fe System. This surplus indicates enormous earnings—no one outside the company knows what they are. The Ford company doesn't make its earnings public. No one objects to such earnings, because in creating them Mr. Ford has not done the public any appreciable violence. Of course if you own a Ford you are entitled to your opinion.

No one, apparently, has been materially injured by the General Motors Corpn. making a net income of nearly $65,000,000, in the first quarter of 1928 compared with only $26,000,000 in the same period for its nearest competitor, the United States Steel Corpn. Alfred P. Sloan Jr., president of General Motors, says sales to users totaled 423,013 cars in the first three months of this year, compared with 329,310 cars in the related period of 1927. Cash, U. S. government and other marketable securities held at the end of the quarter totaled $160,068,830.

This is not a complaint against large earnings; it is intended rather to draw attention sharply to the most unfair regulations under which, in contrast, the steam railroads must exist and give good service so that the great industrialists may record such stupendous prosperity. If the heads of such enterprises made up their minds to do it they could relieve the railroads of most of these onerous restrictions in one session of congress.

Americans know now, as they did not know in the roaring days of Roosevelt's trust-busting, that Big Business produces better goods and sells them for less than the small concerns ever could do a few years ago. But Big Business certainly is neglectful of its self interest in ignoring the restrictions imposed upon the railroads without whose services they could not long exist. U. S. Steel, General Motors, DuPont, Henry Ford, Woolworth, Sears-Roebuck, Montgomery Ward & Co.—how would these concerns like to divide their net with the government at Washington? Do you know any such companies earning as low as 4.73 per cent? You do not, no one, apparently wishes them any such ill luck. But why should these great interests, serving the people, be permitted to clean up in this way while the railroads, serving the same people, are restricted to 5¾ per cent which as a whole they never get because the government keeps rates too low?

Net earnings of the western roads in the first eleven months of 1927 showed a reduction of nine per cent, or approximately 40 million dollars under

the same month of 1926. Net earnings in the northwest region declined 12 million dollars, while there was a reduction of 18 million dollars in the central western region, and a reduction of nine million dollars in the southwestern region. The northwestern roads in the first eleven months, last year, were earning a return at the annual rate of 3.6 per cent on their property investment; the central western roads were earning 4.4 per cent, and the southwestern roads were earning 4.1 per cent. The roads in western trunk line territory, last year earned a return of only three per cent.

Don't forget these railroad figures when you address the Rotary Club or the Chamber of Commerce. They are from testimony given under oath in Washington.

Reminds Us of Something

The car shortage on the Latvian railways is so severe that the administration may have to lease cars from Estonia and Lithuania. Loadings have recently risen to 1500 cars a day up there. The car shortage was created as in this country a few years ago, by failure of consignees to unload shipment promptly. When warehouse space is at a premium so are freight cars whether in Jersey City or Riga.

Perchance to Sleep

A bill was introduced recently in the British parliament, "to provide lying down accommodation on night journeys in third class railway carriages."

The wording, it will be noted, is scrupulously accurate in referring to "lying down" rather than to "sleeping" accommodation. The bill provides that every train which has first class sleeping cars shall have at least one-fifth of its third class compartments equipped with beds, bunks or "stretchers."

The "lying down tickets" as they are called, are to cost only five shillings ($1.25) more than the ordinary third class fare.

The Fixing of Prices

Economists may deny that transportation is a commodity, but this is precisely what it is in the manufacturing plants of steam or electric railroads. And the price at which its manufacturers may sell it is fixed by the government. That price is based upon a valuation ten or 15 years out of date. Supply and demand have nothing to do with it. Consider this fact in relation to President Coolidge's message vetoing the McNary-Haugen Bill last year: "Whatever may be the temporary influence of arbitrary interference," said he, "no one can deny that in the long run price will be governed by the law of supply and demand."

Strange things come out of government. When the prices of certain grains or fruits decline the Interstate Commerce Commission, with "arbitrary interference" cuts the rates the railroads may charge for hauling such shipments, that is to say, it fixes the price of the railroads' one commodity. No matter what may be the supply or the demand for this one commodity the price is unaffected. The law says this price must be fixed to yield a certain return on the manufacturers' investment, but this law is ignored and has been ignored ever since it was enacted in 1920, and the railroads are short nearly two billion dollars as a result. They are receiving no return today on more than four billion dollars added to the value of their properties since 1920, in added facilities. If this isn't using private property for public purposes without just compensation we are quite unable to classify it. We often wonder whether our copy of the United States Constitution is the same as that which is supposed to guide the rate making powers in Washington. Ours came from the Congressional Library, and it may have been the last copy.

Is This the Limit?

In October, 1903, the St. Louis Republic printed a half-page picture of a locomotive to be exhibited in the world's fair in that city in 1904. It was referred to as "the mightiest of modern space annihilators, weighing 200,000 pounds." The matter is referred to here only because it is interesting to note the changes that come in the passing years in the nation's industrial life, few of them more startling than the development of locomotive power. The St. Louis Republic's writer inspired, doubtlessly, by someone who thought he knew what he was talking about, said: "The limit in size apparently has been reached in American locomotives. The gauge of railway track limits the ultimate weight and dimensions of railway engines. Increased power and efficiency can no longer be obtained by the simple process of building bigger locomotives. If locomotive improvement is to continue it must come through refinement of mechanism, within existing limits of size and weight."

Wise men, or some who pass for such, have been saying these things for many years. The 200,000-pound limit was passed before the St. Louis world's fair had long ceased to be discussed.

In this connection it is interesting to note that the Northern Pacific has recently placed an order for an experimental locomotive, having a total weight, including the tender, of 1,082,500 pounds or 541 tons. The new engine is to be used between Mandan, N. D., and Glendive, Mont., to replace two locomotives now used to move tonnage over the existing grades between these two points. It will be 121 feet long, have 20 pairs of wheels, eight pairs of which will be drivers and a grate area of 183 square feet.

We wonder what the author of the St. Louis Republic's article would think now? When will the ultimate limit in weight and size be reached? What do you think about it?

The News in Washington

Railroads and Waterways

By W. J. Patrick

IN A statement authorized by the Association of Railway Executives read to the house committee on interstate and foreign commerce the railroads say they "doubt the advisability of further commitment on the part of the government for an extension of the government's Inland Waterways Corpn. until there has been a thorough investigation of the facts in regard to the present equipment service and operations with a view of determining the entire cost of such operations as would be applicable if such service were carried on by private capital.

"The Inland Waterways Corpn. was created as an experimental enterprise for the governmental operation of barges on the Mississippi and Warrior Rivers in order not only to show the feasibility of water transportation on inland streams but the feasibility of such operation as a private enterprise.

"Before additional appropriations are made and further commitment of the government in water transportation service, competing with private enterprise by rail, there should be set up a proper governmental system of regulation through the Interstate Commerce Commission. Fair competition can not be had where one competitor is compelled to operate under full regulation and the other competitor is left 'free to set its purely port to port rates without reference to the Interstate Commerce Commission.'

"Rail transportation expenses include, in addition to the cost of the actual moving of the trains, such other costs as the maintenance of equipment, handling of freight, maintenance of right of way, payment of fixed charges on the investment, provision of terminals at the entire expense of the railroads, and the large item of taxes in various forms. Except for a portion of the terminal charge, none of the last four expenses enumerated are included in the charges on which the rates to the shipper by the Mississippi River barge line are based. The cost to the shipper includes only the rates paid by the shipper. In addition there is paid by the general public the taxes for providing and maintaining the navigable channel, plus the fixed charges on the government investment in floating equipment, and terminals, plus the cost to the municipality and taxpayers for providing local terminals at less than cost, plus the sacrifice of local, state and federal taxes that would be paid by a private corporation.

Pennsylvania Avenue, Looking Toward the National Capitol.

"For a full knowledge with respect to this experimental demonstration, this committee and the people of the country should have set up for them such costs as would show whether or not the shippers fortunate enough to be able to utilize the barge lines are really paying the full cost of their transportation or are being subsidized, and to what extent, by the federal government at the expense of all the people."

The views of the railroads were presented in connection with hearings on the bill introduced by Congressman Denison of Illinois to increase the capitalization of the Inland Waterways Corpn. by $10,000,000 and to appropriate a similar amount for the use of that corporation.

The need for federal control of interstate bus lines was urged April 10 before the house commerce committee by S. A. Markel of the American Automobile Association, who argued that it would provide for better regulation of the rapidly expanding bus-transportation systems. He appeared in support of the Parker bill, which would provide for control of interstate bus lines by permitting states to control such traffic through state boards or joint state boards with the right of appeal to the Interstate Commerce Commission.

R. N. Van Doren of Chicago, vice president of the Chicago & North Western Railroad and chairman of the law committee of the Association of Railway Executives, testified that railroads generally favored the Parker bill as it was felt there should be some regulation over interstate bus traffic.

Frank Fageol of Oakland, Cal., said that as a bus manufacturer, he felt that regulation of interstate bus traffic would be advisable.

Federal legislation setting up a co-operative system of state and national regulation over motor bus operations on highways was recommended to congress April 21 by the Interstate Commerce Commission.

At the same time the commission held the transportation of property by motor truck at the present time should not be made the subject of interstate regulation.

The control proposed was recommended almost exclusively for passenger transport by motor bus lines.

Under the system proposed, state regulatory bodies would assume primary jurisdiction over the lines, acting in conjunction with each other through joint boards on which the Interstate Commerce Commission would be represented. In any state where state authority failed to appear, the Interstate Commerce Commission would assume power.

Railroads should be authorized to undertake motor operation and all operators intending to undertake service should be required to obtain certificates from the regulating authorities to the effect that public convenience and necessity required their service.

The report also suggested that joint rates between railroads and motor lines should be permitted and that rates for highway transportation should be made subject to regulation, while free transportation by passes should be forbidden to bus lines, as it is now forbidden to railroads.

The Parker Consolidations bill as it has been rewritten by the house committee on interstate commerce, grants the Interstate Commerce Commission power to authorize consolidations when the particular proposal is found to be in the public interest. Definite guides for determining what is in the "public interest" are laid down. These emphasize the necessity of maintaining carrier competition, of preserving service of necessary weak or short lines, and the securing ultimately of well balanced systems competing with each other on a reasonable parity.

The committee, in writing this particular provision, followed the commission's suggestions made during the hearings, that congress should indicate definitely its ideas as to the governing considerations to be taken into account.

No element of compulsion is introduced except that the commission is directed to consider the necessity of including necessary weak lines in any consolidation proposal. Furthermore, the commission would be permitted to attach certain conditions in this connection which must be accepted before approval is given the plan. On the other hand, provision is made whereby the strong lines will be protected against unreasonable demands of the weak lines. The new measure eliminates the requirement that "existing routes and channels of trade shall be maintained." This is not to be taken as sanctioning that they can be eliminated wholly but is intended to permit adjustment to meet changes warranted by traffic developments and demands.

An important feature of the new bill is that no corporation is provided for directly or indirectly except under state charter. There will be no federal incorporation.

The new Parker bill provides that there can be no unifications under state or federal laws except according to its terms. This is termed a "grant of power" which will overcome conflicting state laws, but will not amount to federal incorporation.

Under another provision the railroads will be given full power to carry into effect any reorganization steps necessary to carry out the orders of the Interstate Commerce Commission, regardless of conflicting state laws and anti-trust laws.

All security issues are made subject to approval of the commission. No securities can be issued based on intangible values created by the mere fact of the resulting consolidation. Railroads will not be permitted to capitalize goodwill created by virtue of the consolidation.

The rights of minority or dissenting stockholders are recognized and careful provision is made for their protection.

Prospects of the latest consolidation bill being enacted at this session of congress are very poor despite President Coolidge's optimism in this regard. The house may pass the bill but in the senate it will encounter another measure drawn by a subcommittee.

After reconsidering its former decision on the subject, the Interstate Commerce Commission holds that El Tovar and Bright Angel hotels, operated by the Santa Fe Railroad on the edge of the Grand Canyon, are essential items of that road's carrier equipment.

The result of the finding is to allow the Santa Fe to add $337,478 to its railroad value for rate making purposes, which is the value of the hotels.

On the first examination the commission held that the hotels are noncarrier properties. The reversal of that finding today makes the Santa Fe's total value as a railroad $580,613,098.

A tentative examiner's report approving the project of the Western Pacific to connect up with the Oregon Short Line at Wells, Nev., by new construction, has been filed with the Interstate Commerce Commission. Although the Southern Pacific System and its subsidiary, the Central Pacific, object to the Western Pacific extension, Thomas F. Sullivan, a commission agent who investigated the proposal, concluded that it should be allowed.

While the Western Pacific extension at Wells will be barely a mile long, surface conditions will necessitate the placing of a viaduct over the Central Pacific's main line. As a result the Southern Pacific complained that damage to its business is possible and asserted further that traffic interchange between the Oregon Short Line and Western Pacific is now possible over existing tracks at Alazon.

The examiner held that the utility of the Alazon connection is small and that Western Pacific should be permitted to build its own tracks at Wells as desired.

The workmanship of a man can never rise above the level of his character.—John Burroughs.

Lower Ten On 29 Car Thirty to Chicago

By

W. V. Hawkins

Everyone—Almost—Loves Children, But on a Railroad Train it Seems Easier to Love Them When They're Asleep

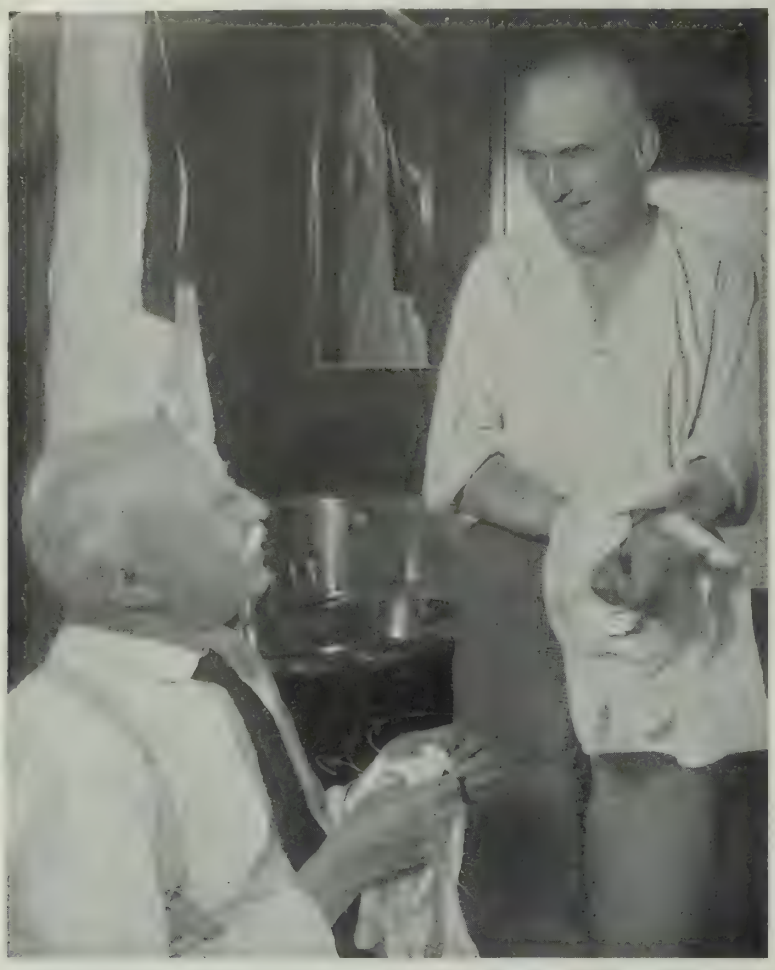
IF YOU have traveled much of course you have heard the story about the foreigner who was puzzled when the Pullman clerk gravely told him the lower berth was higher than the upper although the upper really was lower than the lower, and just as comfortable except that you had to get up in the morning before you could get down. Which draws attention pleasantly to the human craving for lower berths notwithstanding the fact that they are higher than the uppers.

Everyone starting on a journey with the price in his pockets insists on having either a seat in the parlor or sleeping car or a berth of some kind, preferably a lower. If you have gone through the experience you must have wondered at some time how the clerks ever get all the berth reservations properly recorded—which they do not always do, by the way—and how the thousands of reservations are made. Local conditions necessarily determine the system applicable to a particular office or city, take it on the word of H. P. Clements, passenger traffic manager for the Pullman Company. A method thoroughly practicable at one point may be utterly useless somewhere else. Therefore, the most desirable method for handling the distribution of accommodations must be the one especially adaptable to the locality.

The Pullman Company has two plans: Initial terminals and large cities, and intermediate points and small cities. The large terminals such as New York, Chicago, St. Louis, Kansas City, Los Angeles and elsewhere receive and dispatch double and triple the number of Pullman cars previously handled. Only the most efficient method of caring for reservations can long endure with an impatient public.

In New York for example, five Pullman cars are leaving the great Pennsylvania terminal every day on the fast limited where usually but two and three formerly were the maximum. Between 400 and 450 parlor and sleeping cars leave this station every day.

To care adequately for such a volume of traffic, a whole new system has been established. Passenger agents say the volume and the now widely separated sources of the demand made for Pullman reservations have influenced every large trunk line to concentrate this branch of the service in a central distributing office of its own. The mechanism of these clearing



"Yeh," Said the Wise Traveling Man, Wiping His Hands, "They Tried to Hand Me That Bull About Not Having Any Lowers, But I'm Too Long in the Game, See?"

houses makes them one more development of metropolitan conveniences of the transportation world.

In other days a Pullman passenger saw a diagram with the reservation chosen marked thereon, or he had a choice of several possible places in the car. Now the traveler who goes to the ticket office in New York or any other great terminal never sees a diagram.

Due to the popularity of travel, —the passenger agents say it is impossible to use the old methods. The traveler, Mahomet-wise, must go to the diagram; his going being accomplished vicariously, of course, by telephone to a central office. This has become necessary because berths are purchased at many different ticket offices, blocks and even miles apart.

In New York for example, Section 1 might have been sold at a Consolidated ticket office in West 42nd street; Section 2 at the Pennsylvania Terminal in 34th street; Section 3, by the station agent at Trenton, New Jersey. By the use of a central distributing office the various applications can be systematized on a master diagram. This bureau is the mysterious place to which the ticket clerk at the railroad is speaking when he telephones to order a Pullman accommodation.

Taking down the receiver of a special telephone a voice answers him from the distributing office. With only a moment's reference to the diagram the man at the other end tells him just how to make out the green or pink triplicate Pullman ticket so that there is no duplicate when the traveler claims the reservation it calls for on the particular train over which he is traveling.

The conversation for this transaction is standardized. It is confined to set, prescribed phrases which experience has found to be the quickest, most accurate way. For example:

The voice: "XY speaking."

The clerk: "DA speaking. Train 29, 2:55 P. M., Tuesday, February 7, one lower to Chicago."

"Tuesday, February 7?" reaching for the diagram.

"Yes."

"Ticket number?"

"Ticket 684."

"Train 29, 2:55 P. M., Tuesday, February 7, Chicago," confirms the voice, "Lower 10, car 30 ticket 684."

"Lower 10, car 30 train 29," repeats the clerk, "2:55 P. M., Tuesday, February 7, ticket 684."

The voice: "Okay."

The Pennsylvania Railway's distributing office for Pullman tickets is on the second floor of the great New York station. It is not seen by the public. Its business is done wholly by telephone and telegraph. A force of approximately 90 persons, operating in three shifts of eight hours each, is required to handle the business. To insure prompt service 120 telephone trunk lines and a score of private telegraph wires enter the room. These wires come into 65 telephone positions, at which a member of the bureau's force awaits the calls.

The popularity of travel is shown by the daily average of 10,000 telephone calls which have at times risen to 20,000 during conventions, political gathers or sporting events.

Telegrams are cared for by a separate force. More than a thousand such messages are received every day from distant points.

The master diagrams referred to by the ticket agents from various

parts of the city are kept in specially made racks. These racks run lengthwise of a large room. There are 2,000 pigeonholes, open at both ends, so they can be worked from either side of the table. Diagrams for 450 to 550 cars are thus cared for. Since many of the reservations are for advance listing it is necessary to have the long row of pigeon holes. These are divided horizontally according to the days of the week; the top row, Sunday; the bottom row, Saturday.

The main table containing the racks is connected by direct telephone wires with all the ticket offices of the railway system. The clerks with headpieces similiar to those worn by telephone operators —"caps" and the up-curving transmitter horn on the chest, and "plug in" and cords—are thus instantly available.

In addition to the main table, the "public table" receives all telephone calls from the public itself making direct connections with their own operators or taking long distance messages, and reservations from agents who are out on the line.

The manager of the room is enabled to listen to any conversation going on in the office by means of a monitor board on his desk. This is to insure efficiency and courtesy.

The clerks are rotated every month to new tables to make them familiar with the facilities of the whole office. Naturally all are experienced and the railroad can depend upon them for salesmanship as well as for watching the drift and reporting any space shortage to the "extra car desk," close by.

To make certain that there is no mistake, to trace mistakes if they are made, a photostatic copy of every diagram is made and sent by pnuematic tube to the train platform. These photostats require only a minute or two for preparation. Diagrams accordingly can be held in the distributing room until eight minutes before actual train time. Usually, however, diagrams have been closed 20 minutes to a half hour before the train is due to depart.

So the Old Gentleman Had to Take the Upper, and What He Said to the Porter Was Interesting.

This plan followed by the Pennsylvania in New York is duplicated in its general features by nearly all of the larger railways which have terminals there. Some are now making installations and others have ordered them.

"Congested traffic conditions," said Mr. Clements "have made it necessary, for the economical handling of equipment and best serving the outlying points to concentrate all the space at one point where it can be distributed to the many ticket offices where applications for accommodations are made, or even to cities far distant from the distributing office.

"In the diagram rooms there is an opportunity to care for all applications segregated from the noise and confusion of the ticket office proper. Here with efficient personnel and facilities, including adequate telephone service, is the most modern system yet devised for the assignment of sleeping or parlor car accommodations.

"Appreciating congested conditions, the successful handling of the public depends, largely, upon the accuracy and efficiency of the ticket office personnel, and upon a constant striving for accuracy in all matters."

The Human Factor in Using Fuel

The human factor is a very large one in fuel conservation. The particular function of fuel organization is to educate the firemen and engineers, particularly the new men, in the firing and operating of locomotives, so they will be able to produce the required tractive power with a minimum amount of fuel.

When comparative fuel consumption records show that certain engineers and firemen are not getting the best results, fuel supervisors and road foremen show them by practical demonstrations how to bring their records up to those of the more successful firemen and engineers.

Constant comparisons of this character keep firemen and engineers keenly alive to the importance of the efficient use of fuel and of what can be accomplished by careful and diligent action on their part.

Since January 1, 1920, the railroads have used as a standard for measuring efficiency in the use of fuel in the freight service the number of pounds of fuel consumed in hauling 1000 gross tons (weight of car and load) one mile and in the passenger service one passenger car one mile, which for comparative purposes, are called units of fuel service.

Inasmuch as both coal and oil are used as fuel in order to make comparisons on the fuel unit service basis it is necessary to reduce the two fuels to an equivalent basis of motive power production, which the Santa Fe, for instance, does by treating 3.86 barrels of oil as the equivalent of a ton of coal.

Other important factors in fuel savings are: Reduction in locomotive fuel consumed (in firing up and cooling of locomotives) through lengthening of locomotive runs; reduction in train delays on the road; heavier train loading resulting in a reduction of the number of locomotives under steam; and increased application of mechanical fuel saving devices on locomotives.

The Santa Fe uses both coal and oil as locomotive fuel. To insure that both possess the necessary qualities for locomotive fuel a chemical analysis and measurement of the heat value per unit of all fuel offered is made prior to purchase.

The Santa Fe, to secure the most efficient use of fuel, organized a fuel conservation department under the vice president in charge of operation, consisting of a fuel conservation engineer and 18 division fuel supervisors whose duty it is to educate Santa Fe employes, and particularly locomotive engineers and firemen, in the most efficient methods of using fuel.

The Navajo.

A Street Guide Free

When the city of Baltimore changed the names of about 900 streets recently much confusion ensued. Relief came when the United Railways & Electric Co. issued a guide containing all the new names and the old, 46 pages of valuable information. About 20,000 of the guides were issued by the railway and are being distributed without charge. They are in great demand. The company mailed about 4,000 of the booklets to the individual members of the Baltimore Association of Commerce. As a result hundreds of letters have been received in which the company is praised for its move to help the public.

Brakemen 40 Years Ago

The brakeman gives the prevailing tone to the "society" of despatchers' lobbies and other lounging places which he frequents. If he be profane or fault-finding or sour, he can easily spread the influence of these unpleasant traits. A lazy brakeman becomes more lazy, because his work is in many respects easy. Having little to do he demands still less. A foul-mouthed one gives himself free rein because many usual restraints are absent. The prevalence of profanity, which, aside from the question of sinfulness, hampers a man in any aspirations he may have toward more elevating society, is perhaps the worst blot on the reputation of brakemen as a class. Many worthy men among them, and especially among conductors and engineers, have, however, done much to improve the tone of conversation in trainman's haunts, and on the better disciplined roads decorum is the rule, and rowdyism the exception. There is abundance of humor and spirit, however. The brakeman originates whatever slang may be deemed necessary to give spice to the talk of the caboose and round-house. He calls a gravel train a "dust express," and refers to the pump for compressing air for the power-brakes as a "wind-jammer." The fireman's prosaic labors are lightened by being poetically mentioned as the "handling of black diamonds," and the mortification of being called into the superintendent's office to explain some dereliction of duty is disguised by referring to the episode as "dancing on the carpet." — American Railways, 1887.

Brighten the corner where you are, whether it's a shanty, office, caboose or shop. Keep it as clean as your home.

Railway Men in the London School of Economics

Wide World Photo

The Average American's Idea of a Wild Time on a Holiday Is Another Movie. In London, Everyone to Whom It Is Possible Gets Out of Town. This Is the Liverpool Street Station.

By G. E. R. Sherrington

TO THE LATE Sir William Acworth is due the honor of having started the teaching of railway economics in Great Britain. This work began at the London School of Economics in 1895. At a somewhat later date he received assistance from Mr. (now Sir Lynden) Macassey. In 1900 the London School of Economics became a component part of the London University which gave an impetus to transportation as a university course.

Many difficulties had to be met in the earlier days, for the science to be taught was a new one for Great Britain and there were no text books covering the position of British railways at the time. Standard text books, such as Hadley's "Railroad Transportation" were available and certain other American masterpieces, but the lack of such volumes proved no easy difficulty to overcome and was solved only partly by the works of Sir William Acworth himself (1905.)

There were the added difficulties also which always are likely to be met when a beginning is made with any new subject, especially in Europe, where tradition is an all important factor and where innovations are not surveyed with the approval that is common in newer countries.

It should be remembered also that Sir William Acworth had for many years been an outspoken critic of certain railway practices. Although time has proved many of these to be entirely correct it was only natural that certain railways hesitated to advise their students to take courses which advocated the following of policies not in use at that time, such, for instance, as the adoption of the ton mile as a statistical base unit.

An important landmark in the development of the teaching of the subject occurred in 1906 when a minimum financial support for three years at least was guaranteed by some of the railway companies.

As a result of this guarantee a whole-time lecturer on the subject of transportation was appointed and W. T. Stephenson came from the North Eastern Railway to take up this post.

In 1908 the London School of Economics Railway Students' Association was formed by those who had taken railway courses and who desired to keep in touch with one another and with the development of information of foreign railways and pressing railway problems. Additionally, it satisfied a social want and kept together many students employed on the different railways who otherwise would have drifted apart. Since the war this association has flourished with redoubled vigor. In 1926 a party of one hundred of its members paid a fourteen-days visit to the German Railway Company to study German methods of operation.

Among recent presidents of this association have been the late Sir William Acworth, Sir Henry Thornton, chairman and president of the Canadian National System, and Sir Felix Poole, general manager of the Great Western Railway.

Sir William Acworth presented his unique library in 1910 dealing with transportation matters to the School of Economics with the result that to-day the transport branch of the British Library of Political and Economic Science probably is the best collection of transport literature in Europe.

In addition to the series of railway subjects given by the lecturing staff of the school, there are also lectures arranged on such special subjects as railway accounting and railway law which are given by experts in their respective subjects. Serving railway officers do not give any lectures at the school but on the other hand the school lecturers in transport do give lectures to railway employes outside London at centers such as Norwich and Ipswich.

As with all educational activities, the war interrupted the progress that was being achieved but as an outcome of the war through indirect results the transport department of the London School of Economics has in some ways gained considerably.

One of the indirect results which assisted the growth of railway education was the increased interest taken in railway statistics resulting from the Ministry of Transport Act of 1919. Under this Act, the ministry of transport which then took over the duties of the railway department of the board of trade compiled detailed monthly statistics as well as the annual railway returns, and these not only increased the amount of valuable data for lectures but also stimulated interest in their subject.

A further great impetus to the teaching of transportation at the London School of Economics occurred after the termination of the war when it became compulsory for every second-year student who was aiming at a bachelor of commerce degree to take "Organization of Transport" as one of the main studies in the second year's work for this course. In their third year these students are given opportunities to take up further specialized transportation studies in four different groups of work.

The students who take transportation courses may be divided into two groups, namely, those men taking a university course who specialize in transport, many of whom come to the School of Economics from Indian or other eastern railway systems and secondly, those who, being actually in the employ of railway companies come to evening lectures at the school after finishing their office work.

These latter usually take a course of 20 lectures a year, although some try to take two such courses in one academic years. These 20 lectures are spread over the two winter terms and the examinations take place in the late spring. In 1924-25 there were 785 evening railway students.

G. E. R. Sherrington

Certificates are given them at the end of their courses and the standard adhered to is high and compares favorably with the commerce degree standards obtained by the whole time students.

If a railway student obtains three first-classes in his railway courses he obtains a Brunel Silver Medal which is a greatly coveted distinction and makes him a marked man on his railway. For the best prize essay on railway transport each year there is given a Rossberry Prize which is also greatly sought.

The following list showing courses given in the academic year 1925-1926 shows the scope of the transportation teaching at the London School of Economics:

Organization of transport.
Economics of transport.
Inland transport.
History of inland transport.
Ships in relation to their work.
The law of carriage by railway.
Railway law.
Railway statistics.
Commercial railway economics.
Operating railway economics.
General economics with special reference to transport.
Rate making in practice.
Control systems in railway working.
The commercial side of passenger traffic.
Industrial councils on the railways.
Railway accounts.
Railway and commercial geography of the United Kingdom.
Modern road transport operation.

It should be added that the success of the course depends on the encouragement given by the railways to the men who do well.

In 1924, for research work into railway transportation the railway companies formed a railway information bureau, to take up the secretaryship of which I returned from the department of economics at Cornell University, N. Y. This work is closely allied to the teaching work and the material collected besides being sent to the railway companies is used in the lectures given at the school.

Finally, attention should be drawn to the fact that the railways are well represented on the court of governors of the school, among whom may be found Sir Josiah Stamp, president of the London, Midland & Scottish Railway; Sir Sam Fay, late general manager of the Great Central Railway; Sir Hugh Bell director of the London & North Eastern, and Sir Herbert Walker, general manager of the Southern Railway.

In 1926 the railroads of this country spent over five hundred million dollars for iron and steel products, an increase of 21 per cent over 1925. In 1926 the railroads bought nearly one-fourth of the total steel output of the United States.

Who could want a better epitaph than this: "He kept his tears to himself and shared his laughter with others."—Nuggets.

Fifty Years of Baldwin Engines in New Zealand

By A. P. Godber

A Baldwin of 1915 on New Zealand Railways, Pulling the "Mercer Goods": Coming Out of the Parnell Tunnel.

AS THE dominion of New Zealand consists of two islands, North and South, the railway system necessarily is divided. At present, however, the entire system, 3164 miles long, is under the management of the New Zealand Government Railways with head offices at Wellington, the capital.

The country is mountainous. Indeed, the Canterbury Plains, something more than 100 miles in extent, from Christchurch to Timaru in the South Island, is the only flat country in either island. As a consequence the railway trains do not attempt to maintain high speeds over long distances, except on the Canterbury Plains.

at that time was about to establish

For many years the 84 mile stretch of line from Wellington to Longburn Junction, in the North Island, was privately owned by the Wellington & Manawatu Ry. Co., usually referred to more briefly as the Manawatu Company. On December 7, 1908, this company, with all its rolling stock and employes, was taken over by the government and is now a part of the New Zealand Government Railways. The private railways are now limited to a few short sections serving coal mines and timber districts.

Allison Smith, one of the early locomotive superintendents of the New Zealand Government Railways, is credited with being responsible for bringing the first Baldwin locomotives into New Zealand in 1879. The company

through runs in the South Island from Christchurch to Dunedin and on south to Invercargill, a total distance of 370 miles. To care for this traffic six locomotives were ordered from the Baldwin Locomotive Works, then owned by Burnham, Parry, Williams & Co. These were of the Consolidation type with an eight-wheeled tender and were designated as the "T Class." They had cylinders 15 by 18 inches, driving wheels 36 inches in diameter and the working steam pressure was 130 pounds per square inch. Each locomotive alone weighed approximately 53,300 pounds, 47,400 pounds of which were carried on the driving wheels, and enabled these engines to develop a tractive force of 12,400 pounds.

The driving wheels were rather small for the level stretches of the

—Illustrations in this article, unless otherwise noted, are from photographs by the author and W. W. Stewart, Auckland, N. Z. Courtesy of "Baldwin Locomotives."

New Zealand Train on the Rimutaki Incline, Grade 1 in 15; Fell Center Rail System.

Canterbury Plains, but from Oamaru southward the line traverses hilly country, and here these locomotives gave excellent service. Express service as we know it today, was unknown in 1879. All trains stopped at every station; and for this reason the small coupled wheels were an advantage, as the heavy mixed trains could be started with a minimum of slip.

Today, after 48 years of constant service, these engines are still demonstrating their usefulness in shunting service. An additional cab has been added to the tender, telescoping into the old cab, to provide shelter when running tender first.

Near the close of 1884 a rush order was sent to Baldwins for six type 2-6-2 locomotives with eight-wheeled tenders. These were delivered in New Zealand five months after the placing of the order and were at once put to work on the accelerated passenger service across the Canterbury Plains. The classification letter "N" was given them. Their 49¼-inch diameter driving wheels made them veritable flyers as compared with the "T Class" locomotives having 36-inch driving wheels. They at once became popular, and it is said that they were great favorites with the enginemen.

Copper fireboxes and brass tubes were provided, as they were standard on the New Zealand Railways at that time and for many years thereafter. Two Sellers injectors and a crosshead pump were part of the original equipment, but some years later the pump was discarded.

After working on the South Island system for many years all of these locomotives were transferred to the North Island and assigned to the mail trains running between Napier and Palmerston North. Within recent years several of them have been placed in switching service at busy junctions, after the cab had been altered to give proper protection for this work.

Six Baldwin locomotives of the Consolidation type were also shipped to the Government Railways in 1885 designed entirely for freight service. Their small driving wheels, 36¼ inches in diameter, militated against fast running, but some of the drivers managed to get a fair amount of speed out of them. The South Island saw their initiation into service, but they were transferred later to the North Island, where they ended an honorable career after 37 years of strenuous service. They were originally built with flat valves, but new cylinders with piston valves were applied later.

The first locomotives bought from the Baldwin Locomotive Works by the Wellington & Manawatu Ry. Co., were two of the Consolidation type ordered in 1887. Each of these locomotives weighed about 74,000 pounds, the cylinders were 16 by 20 inches and the driving wheels 43 inches in diameter. The front and back pairs of driving wheels were flanged and the two middle pairs had plain treads.

Their sphere of activity was on the hilly section of the line between Wellington and Paekakariki. In this distance of 27 miles there were 13 tunnels, and in some places grades of 1 in 40, or 2½ per cent. In spite of the severe operating conditions the engines were easy to handle, having a steam pressure of 140 pounds per square inch combined with ample boiler capacity. In order to take care of these locomotives on the steep grades, they were provided with a steam brake and a screw hand brake operating on engine and tender wheels, and also a Le Chatelier water brake acting on the locomotive cylinders.

The ability of these locomotives to stand hard use was amply demonstrated when one of them, while negotiating the Paekakariki bank, ran into a landslide and turned turtle, landing on the beach 100 feet below. Upon inspection it was found to have sustained very little damage and was soon in regular service again.

Four years later the Manawatu Company sent its second order to Baldwins, this calling for two

Prairie or 2-6-2 type locomotives with eight-wheeled tenders. The total weight of the locomotives was 67,000 pounds and the weight on the driving wheels was about 52,000 pounds. They had cylinders 15 by 20 inches, driving wheels 49 inches in diameter and carried a steam pressure of 140 pounds per square inch. Shortly after being placed in service one of them created a sensation by reaching a speed, officially checked and timed, of 64 miles an hour, a record never equaled on the New Zealand Railways. A number of the directors of the company were passengers on this occasion so that extreme care was used in timing the run. An average speed of 60 miles an hour maintained for 15 consecutive miles, three of which were done in 59 seconds each, two in 58 seconds each and one in 56¼ seconds, representing speeds of 61, 62 and 64 miles an hour, demonstrating the excellent steaming and easy running qualities of these Baldwin locomotives.

Auckland Railway Station at Night.

In 1894 the Manawatu Company once more made railroad history by bringing into the dominion two Vauclain compound locomotives, one of which was of the Consolidation or 2-8-0 type, and the other of the Prairie or 2-6-2 type. These locomotives aroused intense interest among New Zealand railwaymen. The Consolidation was put to work on mixed traffic between Wellington and Paekakariki. The Prairie, having larger diameter coupled wheels, was placed in service on the more level portion of the line between Packakariki and the terminus at Longburn Junction. Both engines immediately proved their ability to make good time with heavy loads, and it was not long before the drivers were asking for more of them.

The Consolidation weighed about 71,700 pounds on driving wheels; total weight 82,900 pounds; high pressure cylinders 11 by 20 inches, low pressure cylinders 18 by 20 inches driving wheels 43-inches diameter, and a steam pressure of 180 pounds per square inch. The Prairie type was somewhat lighter: Weight on driving wheels about 53,750 pounds, total weight of engine 73,900 pounds, high pressure cylinders 10 by 20 inches, low pressure cylinders 17 by 20 inches, driving wheels 49-inches diameter and steam pressure 180 pounds per square inch.

The success of these Vauclain compounds on the Wellington & Manawatu led the New Zealand government to believe they could increase the hauling capacity of their Consolidation (O Class) and Prairie (N Class) locomotives by adding Vauclain cylinders. With this idea in mind the government purchased from the Baldwin Locomotive Works a number of sets of these cylinders, with the other parts necessary to make the change.

One locomotive, of the "N Class," was the first and only one to be so altered. Strange to relate, this innovation did not prove to be a success. Only one engineer was able to handle this altered locomotive in such a way as to give some measure of success. It was shipped later to the North Island where it is still in active service operating trains out of Napier, on the East Coast Line.

By 1896 traffic conditions on the Manawatu system called for more engine power and an order was cabled to the Baldwin Locomotive Works for a Consolidation and a Prairie type locomotive to be, practically, duplicate of the Vauclain compounds purchased in 1894. The new locomotives were from 3000 to 4000 pounds heavier than the first two, and the steam pressure was increased from 180 pounds to 200 pounds per square inch. All four of these locomotives had fluted connecting rods and the side rods had solid end stubs fitted with Stone's bronze bushings. Today, after 32 years active service they are still in use and giving an excellent account of themselves.

It will be noted that all the activity in which Baldwin locomotives figured between 1885 and 1898 occurred on the privately owned Wellington & Manawatu Railway, but in 1898 the Government Railways made up for this lapse of time by purchasing 22 locomotives in one year.

Ten of these were of the 4-6-0 type with eight wheeled tenders, and the remaining 12 were of the Prairie or 2-6-2 type with side tanks. The ten 4-6-0 locomotives, upon their arrival in the

South Island, were put on heavy express service running out of Christchurch, and quickly demonstrated their suitability. They were well liked by the engineers and fireman because of their capacity to pull and also because of their free steaming qualities.

These locomotives had cylinders 16 by 20 inches, driving wheels 49 inches in diameter, a steam pressure of 175 pounds per square inch, a weight of 60,300 pounds on driving wheels and a total engine weight of 84,900 pounds. The main frames were of the American bar type. One of these engines has attained a speed of well over 50 miles an hour on the Canterbury Plains.

The 12 Prairie type tank locomotives had a total weight of 85,100 pounds and carried 60,300 pounds of this weight on driving wheels. The cylinders were 14 by 20 inches, driving wheel 39¾-inches diameter and a pressure of 170 pounds per square inch was carried. They were landed at Wellington and distributed to various sections including the West Coast section in the South Island and the Taranaki and Whangarei sections in the North Island.

All of these locomotives, purchased in 1898, had Westinghouse air brakes, which were then standard on both the Government Railways and also on the Wellington & Manawatu Ry. All of them, likewise, were equipped with Sellers injectors and Nathan sight-feed lubricators.

The year 1901 was the peak year for the importation of locomotives into New Zealand bearing the brass name plate of "Burnham, Williams & Co.," the firm name of the Baldwin Works from 1891 until 1909. A total of 47 locomotives of various types were delivered during the year, the Government Railways taking 45 of these and the Manawatu Company the remaining two.

One of the locomotives purchased by the Manawatu Company was a Vauclain Compound Mikado type, having a total engine weight of 99,500 pounds with 77,000 pounds carried on driving wheels. The high pressure cylinders were 11½ by 20 inches and the low pressure 19 by 20 inches; the driving wheels were 43 inches in diameter. With a steam pressure of 200 pounds per square inch and ample boiler capacity to add free steaming qualities, this locomotive has proved to be the most powerful machine owned by the railways of New Zealand. This engine originally had a large sweet-toned bell between the sand box and the steam dome, but as grade crossings are rare in New Zealand, the bell was removed. It was later installed on the station platform at Wellington and is still used to hurry lagging passengers to their seats when the trains are about to start.

Vauclain Compound. Built by the Baldwins for New Zealand Railways.

The second received in 1901 by the Wellington & Manawatu was a Prairie or 2-6-2 type, fitted with Vauclain compound cylinders 10 inches and 17 inches in diameter with a 20-inch stroke. The locomotive alone had a weight of 83,000 pounds with 60,000 pounds carried on the coupled wheels which were 49 inches in diameter. A working steam pressure of 200 pounds per square inch was carried.

The most notable lot of locomotives received by the Government Railways in 1901 consisted of 13 4-6-2 locomotives, being the first locomotives of this famous wheel arrangement with wide fireboxes, later known as the "Pacific" type, ever built. The railways designated them as "Q Class" locomotives. Ten of them were landed at Port Lyttelton in the South Island and three at Auckland in the North Island, and on both sections of the line they gave admirable service.

The application of Walschaerts valve gear was an improvement from an operating point of view, as its position outside the frames made it a much simpler matter to repair and maintain the gear. The only serious trouble developed by these locomotives was a propensity for the front truck to leave the rails, but this was quickly remedied by adding a heavy casting to the front end of the frame. This change prevented the lifting action of the front truck and no further trouble was experienced with derailments.

These fine machines, the forerunners of a type of passenger locomotive now used in practically every country in the world, are still in active service handling the mail trains out of Greymouth, on the West Coast of the South Island.

Ten locomotives of the 4-6-0 type, were imported by the government in 1901, and were very similar to the ten locomotives of the same class which had been purchased in 1898. The later engines, however, were improved by having the Walschaerts valve gear incorporated in the design.

The locomotives had the free steaming qualities which characterized all of the Baldwin locomotives in the dominion, and they remain in favor even today, running be-

Baldwin Locomotive of 1901 on the Rotorua Express Leaving Franklin Junction, New Zealand. One of the Original Pacifics.

tween Dunedin and Cromwell. This line abounds in tunnels, sharp curves and heavy grades, but the pulling qualities of the locomotives make them ideal for this difficult service. Two of these locomotives had the distinction of hauling the royal train during the visit of the Duke and Duchess of York in 1927. It is interesting to note that these locomotives were practically duplicates of the 4-6-0 type locomotives, built by the Baldwin Locomotive Works in 1898, which were used to haul the train carrying the former Duke and Duchess of York (the present King and Queen of England) during their visit to New Zealand in 1901.

The remaining locomotives brought in by the government during the year consisted of 18 2-6-4 tank locomotives and four 2-6-2 tender locomotives, all of which did good work on various divisions of the Government Railways.

It was not until 1903 and 1904 that the Wellington & Manawatu Co. once more came into the market for Baldwin locomotives. In those years they imported two of the 4-6-0 type and one 2-6-2 type with eight-wheeled tenders and one 2-8-4 type with side tanks.

The 4-6-0 engines have the distinction of possessing the largest coupled wheels of any locomotives in New Zealand, 58 inches in diameted. The simple cylinders were 16½ by 22 inches and the steam pressure 185 pounds per square inch.

These fliers worked the mail trains between Paekakariki and Longburn Junction until the Manawatu Company was taken over by the government, and of late years they have been assigned to similar service between Frankton Junction and Thames. It is to be regretted that these greyhounds had Stephenson valve gear, as the substitution of the Walschaerts gear would have contributed to easier handling.

The tenders were large for New Zealand and carried 2400 U. S. gallons of water and four and one-half tons of coal, which permitted longer runs without stops for fuel and water.

The 2-6-2 tender engine of 1904 was a Vauclain compound with cylinders 10 inches and 17 inches in diameter with 20-inch stroke, and was practically a duplicate of the Vauclain compound purchased by the Manawatu Company in 1901, except that the total engine weight was increased from 83,000 to 88,000 pounds. Their 49-inch driving wheels made them very handy for either freight or passenger service. They negotiated the steep grades between Wellington and Paekakariki with ease and on the more level stretches their running was characterized by a smoothness that made them a success with the drivers and firemen.

The 2-8-4 tank engine which arrived about this time was put to work as a "baker" on the steep grades near Wellington. This engine was somewhat chunky in ap-

pearance and soon received the appropriate name "Jumbo." It would be coupled to the rear of a mail train out of Wellington, and on reaching Mount Misery, the top of the grade, the driver manipulated a special device whereby the banking engine could be uncoupled without stopping the train.

The boiler had a total heating surface of 1080.3 square feet and a grate area of 16.58 square feet and, when working hard, it demanded all the attention of the fireman to keep up the requisite steam pressure of 200 pounds per square inch. Although the rigid wheelbase was no longer than that of some of the other locomotives in use, "Jumbo" gave a good deal of trouble with broken frames.

The last of locomotives built by the Baldwin Locomotives Works for New Zealand came out in 1914, and consisted of ten Pacific type locomotives with eight-wheeled tenders. They had a total engine weight of 116,500 pounds and a weight of 80,000 pounds on coupled wheels. The cylinders were 18 by 24 inches, the driving wheels 49 inches in diameter and the working steam pressure 170 pounds per square inch. They were very handsome, and their looks do not belie their performance as they have proved to be the most serviceable locomotives possessed by the railway administration. They were equipped with superheaters and fire brick arches mounted on tubes, which added to their efficiency. They were reerected upon arrival, at the Petone workshops under the supervision of a Baldwin representative and at once demonstrated that they were easy-running, free-steaming engines.

Their sphere of activity is on the main trunk line of the North Island, on that portion between Taihape and Taumarunui. This section abounds in heavy grades, both ways, and includes the famous Raurimu Spiral. In a track distance of four miles the rise is 404 feet, yet the distance from Raurimu to the top of the grade is only one and one-quarter miles as the crow flies. In winter the snow is plentiful on these high levels and the greasy nature of the rails tests the pulling power of a locomotive to the utmost. After they were put into service an additional sand dome was added to help out on these severe grades.

Wide World Photo

A Fireless Locomotive Used by a Paper Mill Company in England. The Engine Gets Its Steam From a Boiler Plant.

This brief history shows a total of 111 locomotives, of various classes, built by the Baldwin Locomotive Works for New Zealand between 1879 and 1914. The uniformly good service rendered forms a record which the builders can view with satisfaction.

Preserving Effectiveness

There is no gainsaying the fact that the United States now enjoys a transportation system that is high up toward the peak of perfection in efficiency. The railroads are rendering better service today than they have ever rendered before; but their balance sheets show that the railways of the country, as a whole, are not earning what has been held to be a fair return on their investment. If the railroads are to continue to serve the country efficiently it is plain that they must not be impoverished; and good railway service is so essential to our prosperity and well being that the Interstate Commerce Commission should not be tempted to overlook the financial welfare of the roads when considering the many petitions made them for a reduction in rates. — Nashville Tennessean.

Shocking

In one year, 1924, the Hawaiian Volcano Research Association reported 5,877 earthquakes in Hawaii; and this was the record of only one out of some 430 active volcanos in the world. If all the earth shocks occurring in the whole globe were recorded, it is probable there would turn out to be an earthquake every minute or two, instead of nearly one every hour, as someone has said.

U. S. Leads in Night Flying

Writing on aviation in The Shipstream, Sir Clefton Brancker says: "Most Americans, on coming to Europe are prone to say the United States is doing nothing for air transport, but actually in the United States there is a service between New York and San Francisco flying over two million miles a year and over 700,000 miles of this total at night.

"This is much more than both France and Germany are doing. There is actually no night service operation in Europe today.

"America has the proper setting for military and commercial aviation.

"There are great distances over its soil, with great industrial centers scattered over these great distances.

"In addition, there is a better climate, offering better visibility for the air navigator."

Bicycle riders of India still refuse to use coaster brakes, preferring those operated by hand.

Little Stories About Big Men

President Pearson of the New Haven Tells a Good One to the Division Engineer.

WE SHOULD never take ourselves or our jobs too seriously. A good many Big Men whose names would fill most of this page if they were listed here are hurting themselves and their companies every day because they believe great and permanent damage would be done to something or other if they should be caught laughing.

Most of these men haven't heard their given names since they left school. Their wives refer to them in public as Mister and lower their voices a bit when they do it. Their private secretaries and stenographers could be arrested for what they think about them—men so awed by their jobs, their titles, their salaries, that they have fallen into the belief that a sacred circle surrounds them to keep out the common herd.

This isn't an exaggeration. Anyone who has traveled about very much, whose business, unfortunately, makes it necessary for him to see and talk to executives of all kinds, railroad, industrial, commercial, has encountered the breed. "A curious thing about many men at a dinner with an address to deliver," said Chauncey Depew, one day, "is the way in which many of them make themselves ridiculous. I have seen half a dozen of the finest reputations in the country go to smash at a banquet in New York because certain men spoke too long and did not relieve their speeches—believing, obviously, that it was beneath their dignity to give a display of humor. I have seen a banquet hall literally cleared by men of this stamp."

Some of these inflated gentlemen may smile patronizingly (if alone at the moment) when they read a quotation from Chauncey Depew. But the smile won't get them anywhere worth while. Mr. Depew lived nearly 94 years. He had a job with one road for more than 70 years, a world's record. He was a beneficent power in politics. He might have represented his country abroad in almost any world capital he chose. He was a great lawyer. He had friends everywhere notwithstanding the fact that he talked and laughed 19 rather large volumes of speeches into the ears and hearts of audiences all over the nation, audiences better informed and happier because he had been on the program. He must have been a pretty good man. Anyway, the New York Central never wanted him to retire, and newspaper men, the most cynical critics of public character in the world, always were delighted to be with him. Good humor, laughter never made him neglect business, but he didn't think of the word always with a capital B, he didn't see a halo

around the dollar sign, and a new statistic didn't throw him into convulsions of delight.

"The man who gives his days and his nights wholly to his business or his profession," said Mr. Depew, "without any change of work or proper recreation or play, doesn't live long and his talent deteriorates. He can play golf, or if that is denied him, baseball or football, or if that is too strenuous he can walk or row, or instead of plodding away and spurring a tired brain which has become exhausted by continuous strain, he can put his gray matter upon something else, learn to have an interest in that pursuit and turn to it for relief, recreation and life.

"With one exception, all of my contemporaries are dead who became railroad executives when I did. They died because they were chained to their desks and to their tasks."

If ever any man in the railroad world had a job to try his soul surely it was William, afterward Sir William Van Horne who built the great Canadian Pacific Railway. Space is lacking here to tell the really tragic tale he lived with his faithful associates in getting that line through to the Pacific Coast. But Sir William — long before the handle was put on his name and afterward, too,—always had time for a good yarn. He never forgot how to laugh. He never was afraid his dignity would be lowered. Walter Vaughn, who wrote the Life and Work, says that in his home, in his car, or in his clubs in Montreal, Ottawa and New York, Sir William always was ready to join in a hand at poker or whist. They didn't play bridge in his day. He had mastered the angles of the English billiard table and the mysteries of side and screw, and, despite his corpulency, he handled a cue well. He loved games, and attacked them with a boyish zest which was never quenched, summoning all his extraordinary power of concentration to his aid in the effort to conquer his opponents. He kept a set of chessmen on his business car, and would leave a group of directors and business magnates to do battle over the board through an evening and the long hours of the night with an unimportant secretary.

Chauncey M. Depew at 93.

Sir William didn't neglect the lighter accomplishments of the drawing room either. He could show innumerable card tricks. He could "force a card" as well as a conjurer. When Stuart Cumberland was creating a world wide furore with his feats of so called mind reading, Sir William astonished his friends and guests by displaying a supposedly similar faculty. All through his life he took a curious delight in impressing the beholder by an exhibition of exceptional powers. This he was enabled to do by combining a prodigious memory with a remarkable gift for observation and deduction. He used to tell an amusing story of a test imposed on him in Sir Donald Smith's drawing room after some successful fooling at the dinner table. The party insisted that, seated at one end of the room, Sir William should reproduce a drawing made by Sir George Stephen at the other end.

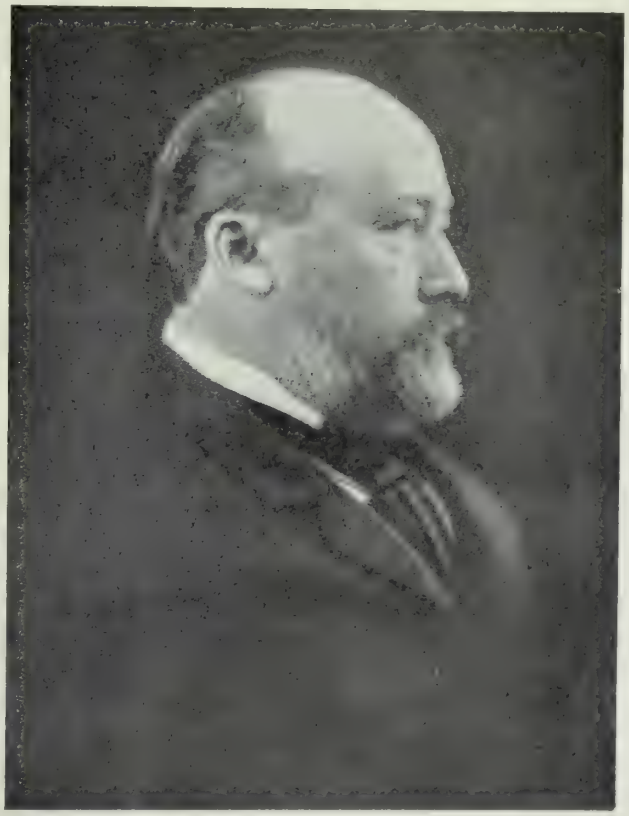
"I didn't know what the devil to do," Sir William said afterward. "As I sat with pencil and paper before me my mind was a perfect blank. Then I began to think and think hard. I suddenly remembered Lady Stephen telling me a few years before that her husband could draw only one thing—a salmon. I cast a sly glance over to the other end of the room, and saw his hand moving quickly in small circles. The scales! So I drew a salmon as quickly as I could. And, by jinks, it was right."

Some executives, and this word doesn't mean railroad men exexclusively, are so constitutionally gloomy they look like Scotchmen on tag day. The author of Ecclesiastes—a book in the Bible, by the way—wrote, "A cheerful heart is good medicine." He must have known that many Big Men need to adopt a more cheerful attitude toward their jobs. Lord Burleigh told Queen Elizabeth she would have to crack her face occasionally if she hoped ever to have any friends. "Win hearts," said the wise Burleigh, "win hearts and you'll have people's purses at your command." Carlisle, a pessimistic dyspeptic if ever there was one, said "the man who has not wholly and heartily laughed is

not only fit for treasons, stratagems and spoils; his whole life already is a treason and a stratagem," and Charles Lamb, ill most of the time and burdened with tragic family conditions said, "A laugh is worth a hundred groans in any market." An editorial writer in Collier's, many years ago, said too few important men know anything about the rollicking rousing laugh of good health. Laughter does the body good, and what is good for the body, usually is good for the soul. "He who laughs," said Goethe's mother, "can commit no deadly sin," and Herbert Spencer, the philosopher, added to this, "Be a boy just as long as you can."

But laugh **with** people, not at them. A cheerful grin will get you in where a grouch is kept outside. You're not the only man whose hair is getting gray, and you're not the only one with a burden. The prophet, Hosea, said of Ephraim, "Gray hairs are here and there upon him yet he knoweth it not." Sneak around back of the screen in your office some morning when a railway supply man is waiting to see you and try smiling for a moment. You may not buy a car but the Ambassador of Industry, the Foe of the Obsolete will go away happy.

Speaking of Scotchmen on tag day brings to mind the fine story-telling of another American who is helping to build up Canada: Sir Henry Thornton, chairman and president of the Canadian National Railways. Some of his tales of racial parsimony among the highlanders are new. He knows how to laugh and make others laugh and enjoy one at his own expense, a rare quality, this last one. Sir Henry is a big man, physically and mentally and he has a whale of a job giving nine million people—which includes the babies, of course—absolutely first class railroad service in a country not yet quite well enough developed to afford it. Under government ownership—there, we nearly got off the track that time. Sir Henry evidently likes his work because he stays human and approachable and willing to listen to a story. The saving grace of humor is still his, a rather rare quality nowdays.



Sir William Van Horne.

Carl Gray, president of the Union Pacific System, is a fairly busy gentleman most of the time. Not much in railroading has missed him, from the days of his first job as an operator at 15 to the present times of big responsibilities. His hair matches his name now but he has never forgotten how to laugh over a good story told by someone else or how to tell one himself — and keep his face straight. Mr. Gray particularly likes yarns about negroes with their whimsical appeal. Like General Grant, he has no use for off-color yarns, and no one who knows him would dare to tell one in his presence. Perhaps you remember the story about the young lieutenant during the Civil War who started to tell a questionable yarn to a group of officers. General Grant stopped him.

"Why," exclaimed the youngster, "there are no ladies here."

"No," said the general, "but there are several gentlemen."

President Gorman of the Rock Island Lines likes stories, and has an infectious chuckle ending in a real laugh that is good to hear. He, too, has been through the ropes, knows all the hard knocks, has seen and heard most of the decencies and the indecencies of life in railroading from a switch shanty to his present chair at the head of La Salle street, and through all of it has kept himself close to the earth. He has a viewpoint in times of worry that sees through things.

One morning in the troubled times preceding the great strike of shopmen, after weeks and even months of restless negotiations that seemed to get nowhere, a public relations man whose job is to tell the public about it, met Mr. Gorman in Dearborn street. "I'm tired of it all," said the middleman of information, "and I wish to goodness we could get it settled."

"Son," said the president, putting a hand on the young man's shoulder, "that's a noble thought, but don't forget that if ever all these things are settled you won't have a job."

Edward J. Pearson, president of the New Haven System, is a hard worker, constantly digging into this and that and the other thing.

Sir Henry Thornton.

He seems to be better known in the East than west of Chicago although he started his railroad career on the Missouri Pacific as an engineer of construction in Kansas, Nebraska, Indian Territory and Texas, and later worked for the Northern Pacific in Oregon and Minnesota. In 1905 he became chief engineer for the Milwaukee in building its Puget Sound extension, and later, in 1911 he went back to the Missouri Pacific as vice president, a preparatory experience of many years which fitted him rather thoroughly for the job he tackled when he went to the New Haven in 1916.

Somehow or other one doesn't expect a vast amount of riotous good humor and laughter and stories among engineers. After they have put in four years surveying the college campus and fifteen or twenty years trying to keep a railroad in first class condition on third class appropriations there isn't usually a great store of ribald enthusiasm left in the poor chaps. But Edward Pearson of the New Haven has survived the test, and what it consisted of on that road would fill an issue of this magazine. Behind his back the men close to him call him a "regular guy" and this is a degree conferred on few in his position. He doesn't like to appear in public, a bad fault in these days of "personal appearances," and he doesn't like publicity for himself, for which reason we have decided to say nothing about him here. He can tell good stories, and he knows how to listen to one without looking all the time as if he were figuring out the strain on a bridge girder, another rare quality. Moreover—and this entitles him to the D.S.O. he never tell stories from the Ladies Home Journal or the Literary Digest. Not even a Rotary Club could ask for anything better than this.

When a Man Serves 50 Years

If you have railroaded up in Canada you know Billy Brown. You may not have called him Billy to his face, which he would not have resented, but you did it behind his back which, after all, is the safest place. Then, too, it isn't just the best kind of manners to address the general superintendent in this way, no matter how good a guy he is at heart. He might, conceivably, find it necessary to fire you some day, and no one likes to fire a man who has been calling him Billy.

But, next time you see him you may use the first name and even give him a slap on the back if he isn't looking your way, because Billy Brown is now on the retired list after 50 years continuous service in the transportation industry of Canada. He retired May 1 as general superintendent for the Canadian National Railways at Edmonton, and turned over his arduous duties to W. R. Devenish, present general superintendent at North Bay. Although his retirement from active participation in the affairs of the company took place May 1, the company as a mark of appreciation of the loyal service he has rendered over a long period, is granting him leave of absence. During that period Mr. Brown plans a trip to Scotland, the first real holiday he has had in half a century.

Billy Brown, as he is intimately known from coast to coast in Canada, is the oldest railway man in point of active service in that country west of the great lakes, and his career is one that covers more than half the entire steam transportation history of the dominion. It goes back to the days of the wood burners when, if fuel for the locomotive ran low, the fireman stripped fences along the right of way to keep the train on schedule. It goes back to the days when, if the train ran off the track, the crew could call on the second class passengers to help jack it back on the rails. It goes to the days when, in a vain effort to assist in the preservation of the vanishing buffalo, standing orders were issued that all trains must come to a stop to allow buffalo herds to cross the track. It goes back to the days when Bill Miner and his notorious gang held up and robbed such trains as they willed, and to the days when trains crossed the St. Lawrence at Montreal over rails laid on the ice.

Billy Brown knows and is known by every old timer between the

W. A. Brown.

head of the lakes and the Rocky Mountains. He stands close to the head of the old timer class himself. Forty-eight of his 66 years of life have been spent in the West. He has served in Fort Arthur, Fort William, Winnipeg, Brandon, Moose Jaw and Edmonton and his work has taken him many times a year to all other important centers in the West. He was railroading on the prairies when there was no steel west of Portage la Prairie. He was with the Canadian Northern when the end of its steel was at Grandview. He was in Edmonton a few days after the first train entered that city, and one of his last official acts was to be a chief figure at the opening of the new Canadian National station there last month.

Mr. Brown began his career as a fireman, and he has run the gauntlet from that to the highest rank the railway has to bestow next to that of general manager. The names of the notables he has accompanied through western Canada read like an abridged Burke's Peerage. A few he has met in an intimate way include the present King and Queen when they were the Duke and Duchess of York; the Prince of Wales; the Duke of Connaught; Sir John A. Macdonald; Sir Wilfred Laurier; the Duke of Sutherland; the Marquis of Stafford; Lord Charles Beresford; Sir James Craig; the Bishop of London; Earl Haig; Viscount Byng; Earl Grey and Lord Willingdon. Governors, lieutenant-governors; men whose names are historical in the public life of Canada and men who are world figures in commerce, industry and professional life are numbered among his personal friends. Scarcely a notable has come to Canada in the past 25 years that Mr. Brown has not met in an intimate way.

Mr. Brown was born in Saint John, N. B., in 1862. At the age of 16 he began his railway career as a fireman on the European & North American Ry., a line 95 miles long between Saint John and Vanceborough. His father was a conductor on the same line. Later the name of the line was changed to the Saint John & Maine Ry. After one year as a fireman he decided to try his hand as a brakeman. In those days there were two qualifications for a brakeman. He had to be strong in the back and the arms so as to turn the hand brakes and he had to know the location of the best spring water along the line. When the springs were reached the brakeman filled a tank and watered the passengers. There was no iceing system for cars in those days. The locomotives burned wood; wood stoves heated the cars and oil lamps provided illumination of a kind. The pay was one dollar a day and as Mr. Brown found he was not becoming rich he asked for and received the additional duties of baggageman. The baggageman was allowed to keep all the excess baggage money and all the dog money. However, most of the passengers were Scotch. They had little excess baggage and the dogs could keep up with the train by running after it. So in 1880 Mr. Brown tendered his resignation bought a second class ticket and went west in search of fortune.

On his arrival in Winnipeg he got a job as a brakeman and from then on his rise was rapid. The spring of 1901 found him super-

—P & A Photo

Here's a Big Man With a Big Job and He Isn't Afraid to Smile. Who Wouldn't Smile in Such Circumstances? Look at the Smiling Lady: But of Course You Looked at Her First. You're Right: Just Married. Mr. and Mrs. Henry A. Scandrett. Mr. Scandrett, as Everyone Knows, Recently Became President of the Milwaukee.

Joseph D. Gavin, Central Figure in a Real Railroad Romance, Last Month, If We May So Designate a Very Interesting Promotion.

intendent at Moose Jaw after having served in various capacities as yardmaster, conductor and trainmaster. In 1902 he joined the Canadian Northern Ry. at Winnipeg. From 1903 until 1905 he was superintendent at Port Arthur. In 1905 he returned to Winnipeg as general superintendent and remained there for three years when he went to Edmonton as superintendent. In 1911 he was appointed general superintendent at Edmonton, and from that position as already related he retired at the end of April.

Joe Gavin Goes Up

A modern Horatio Alger story became public one day last month when announcement was made of the appointment of Joseph D. Gavin to be vice president and general manager of the Yreka Railroad Co. It implies no unfriendliness for Mr. Gavin and certainly no lack of respect to say that until that moment very few persons a block away from the Southern Pacific offices ever had the pleasure of hearing his name. All of which proves, if it proves anything, that Joe has been attending very strictly to business for about 15 years and letting other folk make the noise. Also it shows that you don't have to blow a horn or beat a drum to make the company remember your name.

Joseph Gavin is about 40 years old. For 15 years he has been with the Southern Pacific, rising in that time from some minor capacity to various clerkships and finally to an important place in the passenger traffic department of Los Angeles. As he went along from one job to another Joe had a way of studying things to see what made them run and while at it he seems to have picked up a number of valuable ideas about railroading.

You may not have heard much about the Yreka Railroad Co. which certainly is not Joe Gavin's fault but you will hear a good bit about it in the near future. Yreka, as all normal persons know is the center of a great lumber region in Northern California. The railroad that serves it is at present one of the state's shortest lines running only from Yreka to Montague where it connects with the Southern Pacific. It was built in the year 1883. This road has been purchased by the Klamath River Holding Company. This company plans extensive improvements and extensions into the Scott Valley and toward the coast to open up rich virgin timber and mining sections. When these building plans are carried out it is said, the railroad will have a length of more than 175 miles, extending from Yreka down the Scott River to the Klamath River and thence to Happy Camp, in a copper mining district near the coast. Business men of Northern California and eastern mining interests are said to be back of the rebuilding and extension plans for the railroad and the territory adjacent to Yreka.

Now You May Hear What She Says

An Oslo engineer is said to have solved the problem of silencing airplane motors with an invention based upon the vacuum principle. The whole apparatus, which is attached to the exhaust pipes of the engine weighs less than 10 kilograms and is said to be fireproof and to absorb only approximately 1 per cent of the power of the motor. The invention consists of a sheet metal drum of the same streamline shape as the wings and the exhaust pipes are led into this drum. The apparatus was tried out on a 120 H. P. "Kaje" machine and it is said the 140 revolutions of the engine were reduced by about 20, or approximately 1 per cent of the total power.

Railway Runs All Buses

The last independent bus company in Akron, Ohio, has just been taken over by the Northern Ohio Power & Light Co., which operates the city's street cars as well as all its buses.

Akron is the city where it was predicted a few years ago, the "buses soon would swallow up all local transportation." Buses are rendering a helpful service in Akron, but they are merely supplemental to the street car lines.

For A Man $5; for A Machine 5 Cents

With the Machine You Make Speed, Insure Accuracy and the Day's Business Record Is Complete.

By

Warren L. Hanna

Asst. Supervisor, Office Equipment and Method

HOW a great railroad is solving its various office problems is the story told by recently compiled statistics pertaining to office equipment owned by the Southern Pacific Company on its Pacific Lines.

Perhaps the outstanding feature of the report will be found in the total of office machines—5462 in all, representing an estimated original cost of approximately $1,000,000. These figures may or may not impress the layman, according to the extent of his previous knowledge and ideas of railroad office work. However, to those familiar with the requirements of a railroad office or with the general trend of office practices throughout the country, these totals suggest many ideas.

The first inference is that modern office work has been definitely placed on a machine basis. A second conclusion is that the Southern Pacific, by the adoption of a progressive attitude toward the machine as an office adjunct, is keeping well abreast of modern development in this line.

The advantages to be gained by the use of various mechanical appliances in the office are not always obvious. The old-timer sometimes is prone to regard an important device as a "new-fangled fad" and to question its necessity or value. A general rule, however, the use of time and labor-saving appliances for office work has become so commonplace that we seldom realize their true significance.

There are, in the final analysis, only two basic reasons for the use of the typewriting, the adding, the calculating, the recording and duplicating and the tabulating machine, as well as a host of other devices. The first reason is efficiency; and the second is economy.

Under the head of efficiency may be grouped all the requirements of the increasing complexity of modern business. These are the demands for speed, accuracy, thoroughness, neatness and legibility.

Practically every device in general use is a saver of time and therefore answers the requirements of speed. The typewriter makes possible from 100 to 150 average letters a day. Adding and calculating machines turn out more and better figure work and computations than were ever possible in the old days by "footing." Dictating machines save all the time formerly spent by the stenographer in taking dictation. Tabulating devices turn out a wealth of information at small cost which was formerly not available because of the tremendous number of clerical hours necessary to obtain it.

Accuracy is a feature particularly essential to figure work. Additions and calculations are correct or incorrect, and when mistakes creep in they are likely to prove expensive. Errors in calculation, addition, copying, billing, may not only lose real sums of money, but they may lose customers as well, which is the most costly of all. Footing by hand and head is not only too slow but there is too much chance for error.

The keynote of present day accounting and business control methods is thoroughness. By having at his fingertips full information to the last detail concerning

Modern Office Machines Mean More and Better Work.

every feature of his business, the executive is enabled to direct it intelligently. But back of all this information, and making it possible is the modern filing system aided by various machines that supply the material for the files. It is no longer necessary to conduct a business in the dark by guesswork. Office machines have provided the means of shedding light on every transaction.

Neatness and legibility are, of course, features which are desirable in every field. A concern is likely to be judged by outsiders largely through their contacts with it. If its clerks are courteous and efficient, this makes for favorable regard. If its freight bills and correspondence have a neat and legible appearance, this also impresses favorably. Bills embellished in undecipherable long-hand are certain, in this age of typewriters, to dispose patrons to unfavorable comment. But even aside from this feature, every organization is, or should be, eager to have clear-cut, easily read records. They did not exist before the day of office machines.

The chief source of saving through the office machine is that it reduces the number of employes necessary for a given amount of work. In most cases it is a question of "five dollars a day for the man, or five cents a day for the machine." the latter amount being the average daily cost of a typewriter during its estimated lifetime.

Office machines tend to reduce overtime and peak loads, saving money in each of these respects. A case in point is the experience of a young American formerly employed in a bank in Paris. For weeks at a stretch they worked overtime at night getting out statements, which could have been done by a few clerks on modern statement machines promptly every day. Much present heavy end-of-the-month office work eventually will be done away with by using office machines to keep balances up to the minute from day to day.

Eliminating the cost of errors alone is enough sometimes to repay the cost of the machine. An interesting example is to be seen in the work of a check-writing machine. This, automatically, prints, at one operation both figures and the amount in words, thus obviating necessity for subsequently checking them against each other. Time saved in this way pays for the machine in a very short time—not to mention its preventing costly errors.

The Pacific lines of the Southern Pacific employ several thousand persons. Yet the annual interest and depreciation on the entire 5462 machines owned would only pay the wages of an additional 150 clerks. And it would be absurd to suppose that 150 or even 1500 additional clerks could replace our efficient office machines.

From a superficial viewpoint an array of over 5000 machines may seem a staggering number for the necessities of a single organization. However, figures showing the number of machines owned mean little unless considered with relation to the needs they fill; nor has the cost any special significance except in relation to the value returned. * * *

Our 5462 machines comprise many varieties, and hundreds of makes. Typewriters, of course, predominate. Laid end to end in the popular statistical way we should have nearly a mile of typewriters. There are 3026 typewriters on the Pacific lines; in this number are 72 special billing machines, 145 portables and 37 fan-folds.

The fan-fold, built to handle a continuous roll of folded sheets, is easily adapted, to typing of many transactions of a similar nature. Carbons being a part of the roll, no time is needed for their insertion. The latest adaptation of this type of machine by the Southern Pacific is for making a quintuplicate record of deeds, leases, and agreements for its property

Comptometer Room in the Office of the Auditor of Freight Accounts in the Southern Pacific Company's General Offices, San Francisco.

bureau. Of the portables, a large proportion are in the service of the commissary department, being assigned to dining car stewards.

The remainder of the 5462 is made up of 671 dictating machines, 1065 adding and calculating machines 152 duplicating machines, 38 tabulating machines, and 508 of miscellaneous types. Among this miscellany are included the printing presses and other large machines of related types which are centralized at the duplicating bureau.

Employe Must Be Watchful

Railroads are not liable under the Employes' Liability Act, the Supreme Court decided April 10, when employes working on moving trains are injured by a postal crane, provided the crane is approximately the distance from the track required by the postal regulations.

This decision, of wide importance to railroads, was a victory for the Chesapeake & Ohio which sought to set aside an award made to K. S. Leitch, a locomotive engineer injured by a postal crane at Scary, W. Va.

Rates and Bread Prices

The federal trade commission says the average American family pays 8½ cents for a pound loaf of bread, of which the railroads and other transportation agencies, which carry the wheat and flour going into this loaf, receive but six-tenths of one cent.

The investigation, says the commission, discloses that agencies taking part in the production and distribution of bread, from wheat field to the home of the consumer, receive approximately the following shares of a total of 8.55 cents paid by the American family for every pound of bread consumed:

Farmer	1.15 cents
Miller	0.41 cents
Baker	5.11 cents
Grocer	1.28 cents
Railroads and other handlers	0.60 cents
Total per pound	8.55 cents

It is noteworthy that if the entire transportation charge were added to the amount which the farmer receives, the total would be only 1.75 cents.

The Bell Needn't Ring

A jury in a Los Angeles court decided the other day that if the signal wags the railroad company has exercised due diligence. The jury returned a verdict for the Pacific Electric Co. in the $25,000 damage suit of John Bartee. Bartee's son was killed when a truck on which he was riding was struck by a train at a crossing. It was testified the crossing signal was wagging, but that the bell failed to ring.

Safety Maxims

An accident to the hand starts in the head.

A tool and its mushroom head are soon parted.

A motor car on the track is worth two in the ditch.

Aristocratic Railroaders

By Bert G. Mitchell

Railroading among the Russians ca. This is due chiefly to a difis a different game than in Ameriference in outlook on life. In Russia the educated man must not work with his hands. This gave rise to an aristocracy of education, the intelligentsia. However, the revolution changed this somewhat. The executive and technical positions were filled from the intelligentsia.

The worship of the theoretical is illustrated by the experience of a representative of an American railroad supply corporation. He was trying to get the officials to buy a certain brand of oil. The Russians insisted his oil did not have the exact specifications they had worked out in the office. The salesman tried to show them that his oil was all that and plus. They would not give it a trial.

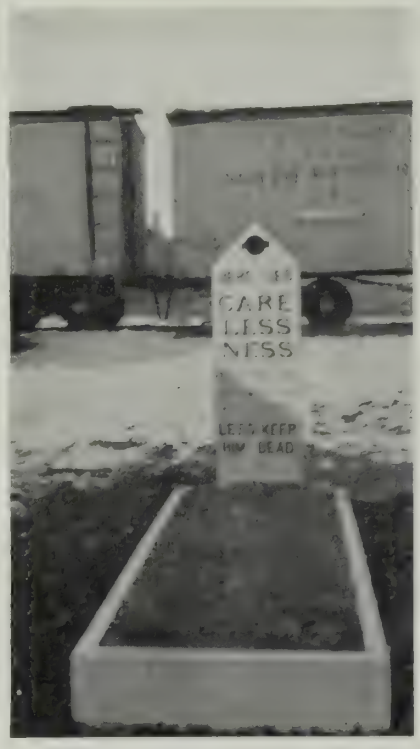
The American made it profitable for an engineer, operating an engine in the headquarters yard, to use only his oil for a week. The salesman very carefully recorded the results.

Returning to the office after the end of the week, he asked the officials to make a test of his oil. They replied that it was useless because, theoretically, it wasn't proper oil for their engines.

The American then told them what he had done and produced the evidence. They very reluctantly agreed to examine the engine. After having examined the engine they had to believe. The American got the order.

The aristocratic attitude of the average university trained Russian railroader toward his job is illustrated by reference to one who was a decided exception.

Ostroumoff was the general manager of the Far Eastern section of the Trans-Siberian. One day he started on an inspection trip without previous announcement. Great consternation prevailed when his business car stopped at a station for an inspection.



A Constant Reminder of Safety First. Antigo, Wis., on the C. & N. W. Ry.

Why hadn't the station "nachalnik" been warned before hand so he could have his staff in their dress uniforms (all Russian railroad officials are uniformed) on the platform to greet the great G. M. with the words: "All is in order in our station, praise God."

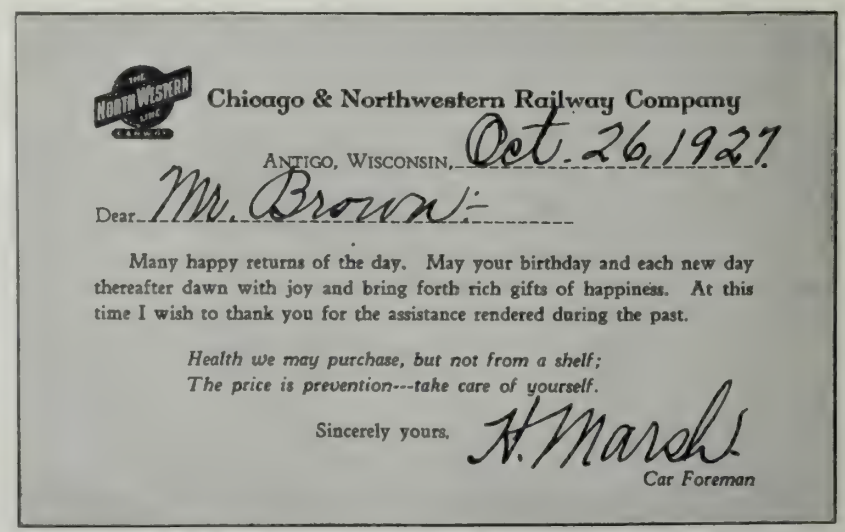
Making the best of a bad situation, the nachalnik saluted his chief and repeated the time honored words. More consternation! Ostroumoff did not reply with the customary words of praise. He only said: "We'll go and see." He then dug around in back of the station and pronounced it filthy; on inspecting the school for the railroad children he declared it was not fit for pigs. He left the station nachalnik shaking with fury and fear.

At a division point he picked up the division superintendent and took him along. While they were riding along he asked the superintendent if instructions were being followed as to tie replacements. On receiving an affirmative reply the G. M. pulled the bell cord and the train stopped. "Let's see," he said. They weren't!

At the shops Ostroumoff asked the master mechanic how much his blacksmith shop was costing him a month. The master mechanic said: "I'll look it up." "Never mind," interrupted the G. M., "anyone can do that. I thought you'd know."

Ostroumoff is a type of railroad official that is becoming more common among the Russians.

Passengers on a railroad train have little to fear from lightning. The steel coaches, grounded by means of the rails, form a metal cage said to be an almost perfect protection against lightning.



Chicago & Northwestern Railway Company

Antigo, Wisconsin, Oct. 26, 1927

Dear Mr. Brown:

Many happy returns of the day. May your birthday and each new day thereafter dawn with joy and bring forth rich gifts of happiness. At this time I wish to thank you for the assistance rendered during the past.

Health we may purchase, but not from a shelf;
The price is prevention---take care of yourself.

Sincerely yours, H. Marsh
Car Foreman

A Pleasant Birthday Anniversary Card Used by Car Foreman Marsh With the Employes of the C. & N. W. Ry., at Antigo, Wis.

Ten Miles of Track in a Day

Irish Were There Of Course

By Erle Heath

FIFTY-NINE years ago a squad of eight Irishmen and a small army of Chinese coolies made a record in track laying that has never been equalled. In one day on April 28, 1869, these men, fired with the enthusiasm of the greatest railroad construction race in the history of the world, laid ten miles and fifty-six feet of track in a little less than twelve hours to bring the rail head of the Central Pacific three and one-half miles from Promontory, Utah, where connection was made a few days later with the Union Pacific to form the first transcontinental railroad.

The names of the Irish rail handlers have been passed down through the years to be reproduced, a few days ago on a page of the original time book, in the Southern Pacific Bulletin. They bring back memories of old time section gangs! George Coley, George Elliott, Edward Killeen, Thomas Daley, Mike Shea, Mike Julian, Mike Kennedy, Fred McNamara, Patrick Joyce, William Carton, Peter Egan.

During six years, says the story, the builders of the Central Pacific, at times numbering 14,000 had pierced the snow-covered, granite walls of the high Sierra and extended their trail of iron over the barren plains 675 miles eastward. For more than five years the Union Pacific had been building westward. Officers of both roads were awake to the future advantages that would accrue to the company having the longest mileage. This rivalry extended through the ranks from the presidents to the track laborers. There followed some marvelous feats of track laying.

One day the Union Pacific broke all records by laying six miles of track. Charles Crocker and his Chinese "pets" building the C. P. were invited to match that. They beat it by a mile. Then the Union Pacific came back with seven and a half miles, working from three in the morning until almost midnight. But the Central Pacific was not to be beaten.

—International Newsreel.

A Record in Early Day Construction on the Central Pacific.

Crocker declared his men would lay ten miles of rail in a day. Such a ridiculous thing was scoffed at in the rival camps, which were now drawing close together. Preparations were made carefully. Ties were hauled ahead by two-horse teams and distributed along the right of way. For some distance the ties were spaced on the already graded road bed. Rails and track materials were moved up from the rear and held in trains ready to advance. More than 4000 men and hundreds of horses and wagons were on the spot. Every man knew his particular job, taught by many months of track work. No one would get in the other fellow's way. In the Central Pacific camp, the patient and methodical Orientals were stirred to a pitch of excitement never shown before, and shared with the few hundred whites the anxiety to get at the job.

April 27, 1869, was the day selected, but an engine off the track early in the proceedings compelled a postponement until the next day. This mishap brought many laughs from the Union Pacific side but served only to arouse the determination of Crocker's men. Bright and early the next morning they were set again and at 7 o'clock the great task began.

Here is the way it was done, according to a reporter for the San Francisco Bulletin, who was on the scene, and verified by Joseph M. Grăham, now living in Berkeley, California, who was an assistant engineer on construction during the building of the Central Pacific.

A train of 16 cars loaded with iron rail and materials for two miles of track was pushed up to the front. Men climbed on top and threw off the fish plates and kegs of bolts and spikes. Others punched side stakes out of the right and left alternate cars. The rails were then rolled off and in eight minutes the 16 cars were cleared. The train was then pulled back out of the way and another train of rail brought into position.

As soon as the material train was gone, small iron hand cars were put on the tracks. Each had a crew of six Chinese working under white bosses. Sixteen rails

Tamping the Ties is Done Differently Nowdays. The Old Way Was Hard on Shovel Handles and Shoulders.

were loaded on each car, with a kegs of bolts, a keg of spikes, and a bundle of fish plates. Two horses with riders were attached to the car in tandem by a long rope. As soon as the car was loaded and the crew on top, the horses were off on the jump. One side of the roadway was kept clear for the horses racing ahead with the material cars. On a down-grade the horses were detached and the car went flying along with one of crew acting as a brakeman. The horses ran alongside and when a level was reached, the nearest rider hooked on again. The first car out from the material dump had to go only a short distance, while the last cars had to go perhaps two miles.

At the same time empty cars were returning on the single track, all of them at full speed. As a full car came closer, the crew on the empty car jumped off and lifted their car from the rails, while the loaded car went past without slacking speed. There was no halt in the continuous stream of materials to the front.

When the loaded car neared the rail head, its gang stepped off and another gang jumped on with picks. They broke open the kegs and cut the fastenings on the fish plates. The keg of bolts was thrown to one side to men who filled the buckets and distributed the bolts. Other men distributed the fish plates. The spikes were poured out over the rails and as the rails were removed the spikes dropped through the floorless car and distributed themselves.

At this point the picked crew of Irish rail handlers, working under Track Foreman H. H. Minkler and Gang Foreman George Coley, came into the picture. A single horse pulled the car up to rail head, where it was blocked by a wooden framed iron track gauge. Four men worked on each side of the track. Two men seized the forward end of the rail with their tongs while the two rear men slipped the rail to the side of the car so it rested on iron rollers. The two forward men trotted ahead the length of the rail, 30 feet, the rear men dropping the rail in place, where it was bolted and spiked by the track gang. The car was then pulled forward to the next track gauge and the procedure repeated.

The track went forward at the rate of almost a mile an hour. A correspondent for the Alta, another San Francisco newspaper, timed the track layers. He wrote: "I timed the movement twice and found the speed to be as follows: The first time 240 feet of rail was laid in one minute and 20 seconds; the second time 240 feet was laid in one minute and 15 seconds. This is about as fast as a leisurely walk and as fast as the early ox teams used to travel over the plains."

But the rail handlers were only eight of several hundred men at the front, everyone of whom was an important cog in the smooth-working machinery. Ahead were three "pioneers," the most advanced men, who, with shovel and by hand, butted the ties to a rope line measured from the track-center spikes set by the surveyors. About half the regulation number of ties were placed at first to insure having sufficient for the ten miles.

Just behind the rail layers came the spikers, bolters, and those who distributed the materials. Then came the gang that surfaced the track by raising the ends of the ties and shoveling enough ballast to hold them firm. Immediately following was a "reverend looking old gentleman" who sighted the line of the rails and, by mo-

tion of his hands, directed the track straighteners. Then the tampers, 400 strong, with shovels and tamping bars.

The scene was an animated one. From the first "pioneer" to the last tamper, about two miles, there was a line of men advancing a mile an hour; iron cars with their load of rails and humans dashed up and down the newly laid track; foremen on horseback were galloping back and forth. Keeping pace with the track layers was the telegraph construction party. Alongside the moving force, teams were hauling tool and water wagons. Chinamen with pails dangling from poles balanced over their shoulders were moving among the men with water and tea.

Farther back, locomotives were waiting with their cars of materials. Five train loads were used on that day. When one section was completed, the next material train was moved up as far as possible on the new track and materials for another two miles unloaded. In the rear of all this was the boarding house train and quarters of officers, a long line of wood houses built on flat cars, looking like a small town stretched out. In the valley below, continuous trains of wagons and mounted work shops moved along in parallel lines.

When a halt was called for the midday meal, six miles of track had been laid and the men were confident they would reach their goal. A number of Union Pacific officers had lunch with Stanford, Crocker, and others of the Central Pacific. They were ready to extend congratulations. "Victory" was the spot where lunch was taken. The station is now called Rozel.

After lunch the work went on, but not so rapidly. The ascending grade on the west slope of Promontory Mountain was more difficult than the section covered during the morning and there were many curves. Considerable time was lost in bending rails, which was done by placing the rail on two blocks and forcing it into the desired curve by blows of a heavy hammer.

When the forward march was halted at 7 o'clock, ten miles and 56 feet of new track had been added to the Central Pacific. Jim Campbell, boarding boss and later superintendent of the division, jumped into a locomotive and ran it back over the new line at a clip of 40 miles an hour just to prove that the job had been well done.

The task had involved bringing up and putting into position 25,800 ties, 3520 rails averaging 560 pounds each, 55,000 spikes, 14,080 bolts, and other material making a total of 4,462,000 pounds.

The Needle, Watson

No trace of the flyers was found, but the condition of the plane indicated that they had jumped from the plane before it landed, or left it after it descended.—Unidentified Clipping.

Herter Photo

Looks Like a Fairy Tale Dragon, Doesn't it? The S. S. Schwerin, German Railroad Ferry on the Baltic Sea. The Bow Raises, Like a Jaw, Lets 40 Freight Cars Board the Ship, and Then Closes So They Won't Fall Off.

A 70-Ton, 600-Volt Combination Trolley-Battery Locomotive, Built for the Chicago, North Shore & Milwaukee R. R.

New Type of Electric Locomotive

Two electric locomotives of a new type, designed to operate from either trolley or storage battery power, and which will automatically recharge the storage batteries when power is supplied by the trolley, have been put in service by the Chicago, North Shore & Milwaukee R. R. Provision is made for automatically charging the battery when necessary from the trolley supply. The locomotive is thus available for use on both trolley supply and on tracks not so equipped. The flexibility of operation enables these locomotives to switch into industrial plants not equipped with trolley connections. The absence of smoke, noise and noxious gases will permit running the locomotives into buildings where a steam locomotive would be objectionable.

The locomotives were built by the General Electric Co. The equipment on each includes four 200-horsepower motors and a 192-cell storage battery capable of delivering 260 kilowatt-hours on one charge. Operating on the battery, one of these locomotives can haul a 1,000-ton train at a speed of from 10 to 12 miles an hour on tangent level track or running light can attain a maximum speed of from 30 to 35 miles an hour.

A motor generator set rated 25 kilowatts is situated in the main cab. Its control is automatic by the use of a contact in an ampere-hour meter in the battery circuit. When the battery becomes fully charged, this contact causes the motor-generator set automatically to shut down. When the battery becomes about 15 per cent discharged again, the set is started automatically. If, while the motor generator set is running, the locomotive leaves the electrified line, the set will shut down and start again upon the return of trolley power, without attention from the operator.

Transfer from trolley to battery power is made automatically by means of a relay which actuates the transfer contactors. In order to restore trolley power, however, it is necessary to move the master controller to the first notch.

Each locomotive has a one-hour rating in tractive effort of 22,000 pounds at 14 miles an hour, and a continuous rating of 17,000 pounds at 15 miles an hour when operating from a 600-volt trolley.

The C. P. R. Plants Trees

The Canadian Pacific has planted 110 miles of evergreen hedges along its right of way on eastern lines and contemplates planting 40 miles more this year as protection against drifting snow. Farmers in the Vauxhall district of southern Alberta planted over 17,000 trees around their homes in 1927. Similar wind screens are taking their place all over the western plains, giving to many spots the pastoral effect of an old world country side.

Mission Chimes Mean Eats in Australia

The Southern Pacific adopted mission chimes about two years ago as the call to meals on its trains. Not long ago F. S. McGinnis, passenger traffic manager, received a letter from W. L. Arlett, chief traffic manager for the Commonwealth Railways of South Australia, saying he had heard the dinner chimes while traveling in California and liked them so well that he wished to use them on his company's dining cars. The first shipment of chimes went to Australia last week.

Making Airplanes Fool-Proof

Before incredulous experts, Capt. Geoffrey De Haviland took his Moth up over London, stalled his engine at a height of 200 feet, and deliberately crashed to the ground of Staglane Airdrome. The little plane crashed, crumbled; the experts gasped. But from the mess stepped Capt. De Haviland, smiling and nodding his head as if to say: "So you see, gentlemen, these Handley-Page automatic slots of which I have been telling you really do make an airplane fool-proof." The slots, attached to the wing tips, automatically open in case of accident, not unlike a parachute and let an unhappy pilot down easy.

Discouraging for Wreckers

Jasper Williams and James Lee, negroes, wrecked a passenger train on the Southern Railway, last March, near Jesup, Ga. The fireman was killed and the engineer seriously injured. Both were tried for murder and found guilty. The court sentenced Williams April 25 to life imprisonment and Lee to death in the electric chair.

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

A LARGE attendance of railroad superintendents is expected for the annual convention to be held June 12-14 at Memphis. J. M. Walsh, superintendent of the Memphis division of the Illinois Central, is president, and for this reason the citizens of Memphis are making extra efforts and arrangements to entertain the visitors. Several railroad presidents are included among those named as principal speakers for the convention and banquet. Among these are L. A. Downs, president of the Illinois Central; R. H. Aishton, president of the American Railway Association; George Hannauer, president, Boston & Maine; J. E. Hutchinson, vice president, Frisco System; L. W. Baldwin, president, Missouri Pacific, and R. B. Pegram, vice president, Southern Railway. Special trains will be provided for the superintendents, one leaving Chicago about 8 a.m. June 11 on the Illinois Central and one leaving Kansas City about 8 a.m. that same day on the Frisco. Both trains will reach Memphis about 7 p.m. The convention will be called to order by President Walsh at 10 a.m. June 12. Business sessions will be held mornings and afternoons. The Southern Railway will run a special train to Muscle Shoals, Ala., Saturday, June 16, for the delegates and their families who care to make that interesting trip.

Besides President Walsh, the officers of the American Association of Railroad Superintendents elected at San Francisco last year were: First vice president T. B. Wilson, vice president and manager of the Southern Pacific Motor Transport Company, San Francisco; second vice president J. K. Savage, general superintendent of the Canadian Pacific Railway, Montreal; third vice president F. M. Brown, superintendent, Pittsburgh & Lake Erie, Pittsburgh, and fourth vice president J. J. Franco, general superintendent of the National Railways of Mexico, Mexico City. F. W. Venton, Crane Building, Chicago, is secretary of the Railway Equipment and Exhibit Association.

J. M. Walsh, President, and T. B. Wilson, Vice President, Superintendents' Association.

Two Air Exploits in April

Capt. George H. Wilkins of Australia and Lieut. Carl B. Eielson of North Dakota, in a Lockheed-Vega monoplane, set out April 15 from Point Barrow, Alaska, and landed at one of the Spitsbergen group 20 hours and 20 minutes later. Here they were storm-bound for five days, during which time they lived and slept in their plane. Finally, with only enough fuel to carry them a hundred miles, they "hopped off" for the Green Harbor wireless station, 25 miles distant, where they arrived Saturday, April 21, having completed the first transpolar flight by airplane.

The German Junkers plane Bremen, a single-motored ship, bearing Capt. Hermann Koehl, Col. James Fitzmaurice and Baron Gunther von Huenefeld, did what was thought to be impossible when they crossed the North Atlantic Ocean in storm and sleet from east to west, the first airmen to make that venturesome flight, and landed, April 13, on barren, ice-bound Greenly Island in the Straits of Belle Isle off the Labrador coast. The landing was made safely in a terrific storm just when their fuel supply was about exhausted. Relief planes were sent to Greenly Island to fetch the aviators to New York.

Erie to Spend 26½ Millions

The Erie Railroad's capital expenditure budget for 1928 totals $26,403,227. The company will order 35 heavy freight Mikado type locomotives, one oil electric locomotive, 25 all steel passenger coaches, 3 steel baggage and mail cars, five steel express cars, two steel dining cars, 1000 heavy duty box cars, and one new tug for New York harbor.

Many existing locomotives will be equipped with labor and fuel saving devices and much rolling stock will be rebuilt and modernized. For the New York harbor service one new steel car float of 23 cars capacity will be built. One Diesel engine driven lighter and five open hand hoist lighters will be added to the New York fleet; also one steel car float, three track and 23 car capacity, will be added.

Installation of automatic block signals between Meadville and Salamanca will be completed; automatic train control will be carried forward. At various points passing tracks will be lengthened to 125 car capacity. The stock yard facilities at Buffalo will be enlarged. In the shops at Meadville, Hornell, Port Jervis and other points many thousands of dollars of labor saving machinery will be installed, making these shops thoroughly up to date.

The new locomotives will be placed in service between Hornell and Port Jervis. This will make necessary the remodeling of the freight yard at Port Jervis.

Various improvements and betterments to roadway along the whole line from New York to Chicago will be carried forward in connection with the program of laying 47,000 tons of new heavy steel rail.

The purpose of the 1928 expenditures is to continue the program of increasing the efficiency of the railroad, improving its service and reducing transportation costs by the most modern and efficient means.

S. P. Iron Horses Are Still Growing

The Southern Pacific has placed an order approximating $1,400,000 for ten of the heaviest locomotives in use west of Ogden, and the longest locomotives yet constructed for the company, according to F. W. Mahl, general purchasing agent at San Francisco. The new locomotives will be 120 feet long over all and 16 feet four inches high. When loaded they will weigh 895,100 pounds and have a tractive power of 112,760 pounds. Unlike most locomotives these will have the cab built in the front of the engine so that the engineer will have an unobstructed view.

The locomotives will burn oil and have boiler pressure capacity of 235 pounds which exceeds that of any other locomotive now used by the railroad. Steam from the one boiler will be used through two pairs of cylinders to drive two sets of driving wheels each having eight wheels.

The locomotives will be built in the East and will be equipped with modern appliances. They will be delivered to the company by the end of August and will operate on the Overland Route between Roseville, Cal., and Sparks, Nev.

March Net Some Lower

Class I railroads in March had a net railway operating income amounting to $90,774,159, which, for that month, was at the annual rate of return of 4.66 per cent on their property investment, according to reports filed by the carriers with the bureau of railway economics. In March, 1927, their net railway operating income was $94,602,380 or 4.97 per cent on their property investment. Property investment is the value of road and equipment as shown by the books of the railways, including materials, supplies and cash. The net railway operating income is what is left after the payment of operating expenses, taxes and equipment rentals but before interest and other fixed charges are paid. This compilation as to earnings in March is based on reports from 186 Class I railroads representing a total mileage of 239,634 miles.

Gross operating revenues for March amounted to $505,184,897 compared with $531,615,880 in March, 1927, a decrease of five per cent. Operating expenses in March totaled $373,304,702 compared with $395,737,420 in the same month in 1927 or a decrease of 5.7 per cent.

Class I railroads paid $31 373,359 in March, a decrease of $203,792 or six-tenths of one per cent under the same month in 1927. This brought the total tax bill of the Class I railroads for the first three months in 1928 to $88,863,780, a decrease of $1,469,240 or 1.6 per cent below the corresponding period in 1927.

Twenty nine Class I railroads operated at a loss in March of which 15 were in the eastern, one in the southern and 13 in the western district.

Class I railroads for the first three months in 1928 had a net railway operating income amounting to $217,347,021 which was at the annual rate of return of 4.41 per cent on their property investment. During the corresponding period of the preceding year their net railway operating income amounted to $225,531,353 or 4.69 per cent on their property investment.

Gross operating revenues for the first three months in 1928 amounted to $1,419,203,158 compared with $1,488,765,314 during the corresponding period in 1927 or a decrease of 4.7 per cent. Operating expenses for the first three months period of 1928 totaled $1,085,200,515 compared with $1,145,579,943 during the corresponding period the year before or a decrease of 5.3 per cent.

Northwest Roads' Program

Improvement and maintenance programs of Northwest railroads for 1928, on which work was started in April, call for expenditure of more than $100,000,000 and employment of 6000 to 8000 additional men. The Northern Pacific will take on about 500 additional men this spring. It will spend approximately $13,000,000 for roadway and building maintenance, including rail and tie replacement and ballast; $17,500,000 for equipment maintenance, and $10,000,000 on improvements, including two new lines in Montana.

The Great Northern will spend about $35,000,000 for maintenance of equipment and roadway, giving employment to 1500 or 2000 additional men. It also will complete a 70-mile branch in northern Montana. Its new tunnel through the Cascades will cost about $25,000,000.

The Omaha road will do more maintenance work this year than for a long period. It will employ 400 additional men with the opening of spring work, and will increase this number to 700 by midsummer.

The Omaha program for this year includes: Laying 119 miles of 100-pound rail in place of lighter steel; laying 60 miles of usable rail in replacement; 112 miles of new ballast; replacement of several bridges by permanent structures and improvement of buildings; improvement of shops in St. Paul and purchase of new equipment and tools; purchase of eight new heavy-type switch engines for Twin Cities terminals; purchase of two gas-electric coaches. Total budget for betterments and additions and maintenance of roadway and equipment is $8,000,000.

The Burlington will spend $2,600,000 on improvement of its lines between the Twin Cities and Chicago, giving employment to 2000 additional men, most of whom will be obtained in the Twin Cities. Virtually all of this work will be done between the Twin Cities and La Crosse, and most of it on the Wisconsin side of the river. It will consist of straightening track and completing the double track program which will give the Burlington a nearly straight, double-track road for 300 miles down the river from the Twin Cities to Savanna, Ill.

The Soo Line, in addition to its regular maintenance program, will spend $5,800,000 for betterments and additions. About $2,000,000 of this will be spent in the Chicago district and $1,100,000 in Wisconsin.

S. P. Earnings Increase

Net railway operating income of the Southern Pacific for the first quarter of the year increased $1,456,521, or approximately 18 per cent, from $8,127,619 reported in the corresponding period of last year, to $9,584,140 for the first three months ended March 31, last.

March net railway operating income amounted to $4,599,156, which is a gain of $792,209, or more than 20 per cent above $3,806,946 reported in March, 1927.

Although total railway operating revenue of $67,313,728 for the quarter, was slightly below that of 1927, a reduction in operating expenses of $1,857,230 to $51,795,379 left a balance for net revenue from railway operations of $15,518,349. This is a gain of $1,290,520, or more than 9 per cent, over the corresponding period of last year.

March railway operating expenses amounted to $17,762,771, as compared with $18,798,224 in March, 1927, a decrease of $1,035,452. Net revenue from railway operations increased $468,214 to $6,480,917.

Freight Loadings Go Up

Revenue freight loading for the week ended April 21 totaled 944,694 cars, the car service division of the American Railway Association reports. Compared with the preceding week, this was an increase of 32,317 cars with increases reported in the total loading of all commodities. The total for the week of April 21 was a decrease, however, of 5,851 cars below the same week in 1927 as well as a decrease of 28,464 cars compared with the corresponding week two years ago.

Miscellaneous freight loading for the week totaled 384,469 cars, an increase of 11,060 cars above the corresponding week last year and 15,121 cars above the same week in 1926. Coal loading totaled 149,015 cars, a decrease of 1,102 cars below the same week in 1927 and 17,579 cars below the same period two years ago. Grain and grain products loading amounted to 39,601 cars, an increase of 4,062 cars over the same week last year and 1,222 cars above the same week in 1926. In the western districts alone, grain and grain products loading totaled 27,503 cars, an increase of 8,045 cars above the same week in 1927.

Live stock loading amounted to 27,445 cars, a decrease of 1,358 cars under the same week last year and 2,923 cars under the same week in 1926. In the western districts alone, live stock loading totaled 21,437 cars, a decrease of 933 compared with the same week in 1927.

Loading of merchandise less than carload lot freight totaled 259,359 cars, an increase of 2,285 cars over the same week in 1927, but 4,162 cars under the corresponding week two years ago. Forest products loading amounted to 65,372 cars, 707 cars below the same week last year and 12,320 cars under the same week in 1926.

Pacific Electric Changes Fares

The Pacific Electric Ry. Co. has made a trial revision of its fares in southern California. One way fares between Los Angeles and neighboring points have been lowered but there has been an increase in commutation fares and local zones have been revised causing, in many cases, an increase. Low rate passes are being issued for use to all points of the line on Sunday. The plan is intended to place the fares at the minimum required for operating expenses in the belief that increased passenger volume will offset the losses caused by the reduction.

Pacific Electric officials report heavier loads being carried in all cities outside of Los Angeles and between there and other cities, but patrons affected adversely by the new rates are opposing them.

Where Does She Get the Raw Material?

If the Traffic Club of Kansas City, Mo., loses a lot of its members to New England the fact may be blamed—or, as he would say, credited—to George Hannauer, president of the Boston & Maine, who addressed the club May 1 at a luncheon in his honor. With the center of population 500 miles farther west than it used to be a few years ago, he said, New England, occupying only 2 per cent of the nation's area, and having a scant 7 per cent of the population, nevertheless produces more than 11 per cent of the country's manufactured products. Read what Mr. Hannauer said about a survey made recently by the department of commerce and soon to be released:

"New England is shown to produce more than a third of all the country's cotton goods, more than a third of all the boots and shoes, two-thirds of all the worsted goods and two-thirds of all the woolens, two-thirds of all the rubber boots and shoes, and two-thirds of all the textile machinery, with very substantial proportions of the products of industries allied with these. Large as New England's textile and boot and shoe interests are, they represent only 30 per cent of New England's industrial output. That region produces more than one-half of the ammunition made in the United States, and three-fourths of all the firearms; one-third of all the optical goods, one-third of all the brushes, a third of all the silverware and a third of all the motorcycles and bicycles; a third of all the corsets (I didn't know that corsets were still being made until the department of commerce made its discovery), and a third of all the felt hats; a third of all the typewriters and a third of all the wire, a third of all the tools and a third of all the jewelry, almost half of all the hardware, and one-quarter of all the country's sporting goods.

"A survey of New England communities by the New England council shows that for every industry which has moved away there has been a gain of at least one other industry."

Santa Fe Buys 58-Mile Road

The Clinton & Oklahoma Western has been sold by Frank Kell of Wichita Falls and associates to the Atchison, Topeka & Santa Fe. Application has been made by the Santa Fe for authority to take over and operate the property. Mr. Kell was president and principal owner of the Clinton & Oklahoma Western, which was recently granted authority to extend its line 60 miles from Cheyenne, Okla., to Pampa in the Texas Panhandle. At Pampa connection would be made with the Amarillo-Kansas City line of the Santa Fe. The Clinton & Oklahoma Western runs from Clinton, Okla., to Cheyenne, 58 miles. It intersects the Missouri-Kansas-Texas at Hammon Junction.

Busy Buses in Minnesota

Minnesota's 29 bus-operating companies had gross revenues of $4,731,386 and operating expenses of $4,527,508 in 1927, according to their reports to the state commission which regulates common carriers. Varied experience in operation is shown by the reports and there was a wide spread in costs per bus mile.

The 29 lines operate 369 vehicles with total seating capacity of 9262 and are authorized to operate over routes aggregating 6218 miles. For the year, they traveled 18,283,126 miles and carried 12,351,612 passengers.

Excluding taxes, operating expenses aggregated $4,195,409. Taxes were $222,911 for licenses; $64,830, gasoline tax; and $44,357, "other" taxes.

The Northland Transportation Co., subsidiary of the Great Northern, did the largest business and the Twin City Motor Bus Co. was second in volume.

The Northland operated 127 buses a total of 7,065,757 miles over routes aggregating 2754 miles. It carried 2,597,291 passengers for gross revenue of $2,012,000 with operating expenses, including taxes, of $1,806,997. Taxes were $94,000 for licenses, $26,200 for gasoline tax and $5000 for other taxes.

Service afforded by Northland buses

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in certain communities has enabled the Great Northern Railroad to discontinue several local steam trains. It has been estimated that savings to the railroad from such discontinuance of trains amounted to $600,000 in 1927.

The Twin City Motor Bus Co. furnished Minneapolis-St. Paul interurban and suburban service, operated 5,115,945 bus miles, carried 5,285,254 passengers and produced total revenue of $1,255,413. Operating expenses, exclusive of taxes, were $1,088,945. Taxes were not shown in the report.

New York Fares to Go Up

Permission has been granted the Interborough Rapid Transit Co. of New York to charge temporarily a seven-cent fare on its subway and elevated lines. The fare has been five cents. The seven-cent fare was granted by the special federal statutory court recently appointed to deal with the dispute between the transit company and the city.

The three judges were unanimous in upholding the contention of the company that it has been subjected to confiscatory regulations. But in answering the company's suit for a permanent rate increase they ruled for the appointment of a master who will hear evidence as in an ordinary rate case before making a permanent ruling.

The temporary nature of the decision is emphasized further in the provision that before the company can start collecting the seven-cent fare it must post a bond large enough to refund all money collected in excess of five cents per passenger in case of a reversal by the higher courts.

Car Demands to Increase

Transportation requirements for 29 of the principal commodities in the second quarter this year (April, May and June) will be about 9,035,963 cars, an increase of about 323,250 cars above the same period in 1927 or 3.7 per cent, according to reports just received by the car service division of the American Railway Association from the thirteen shippers' regional advisory boards which now cover the entire United States.

This estimate is based on the best information obtainable as to the outlook, so far as transportation requirements are concerned, by the various commodity committees of the 13 separate shippers' regional advisory boards.

Aviation Meet at Detroit

A national aeronautic meeting will be held in Detroit, June 28 and 29, by the aeronautic division of the American Society of Mechanical Engineers. The meeting will be under the auspices of the society's Detroit section which has arranged the meeting so as to co-ordinate with other well known aviation events taking place there.

The events taking place in Detroit during this time are Gordon Bennett International Balloon Races, Reliability Airplane Tour and Boys' Airplane Model League Convention and Tournament.

The preliminary program of the engineers calls for technical sessions on: transportation, wood in aircraft, design, airway developments, power plant and international developments and military aviation. Excursion tours to interesting plants are being arranged for the afternoon of June 29. A banquet is planned for Thursday evening, June 28, at which the internationally known participants of the contests will be present.

Cars in Need of Repairs

Freight cars in need of repair on April 15 totaled 145,278 or 6.5 per cent of the number on line, according to reports filed by the carriers with the car service division of the American Railway Association. This was an increase of 5,580 cars above the number reported on April 1, at which time there were 139,698 or 6.2 per cent. Freight cars in need of heavy repairs on April 15 totaled 103,006 or 4.6 per cent, an increase of 2,306 compared with April 1, while freight cars in need of light repairs totaled 42,272 or 1.9 per cent, an increase of 3,274 compared with April 1.

Orders for Car Floats

The Pennsylvania has placed orders for seven car floats and one steam lighter with the American Brown Boveri Electric Corpn., and two tug boats with Pusey & Jones, Wilmington. The equipment will be used in the Pennsylvania marine service in New York harbor and will cost about $1,000,000.

B & M Net Decrease

The Boston & Maine in March earned a net income of $660,950, compared with $644,516 in March last year. For the first quarter, the figures show a net income of $1,423,248, compared with $987,924 in the first three months last year.

The improved March showing was made, as in previous months this year, notwithstanding a reduction in operating revenues, amounting to $325,911, of which $170,663 was in passenger and $98,897 in freight revenues.

With the Boston & Maine's equipment maintained to a higher standard than in any previous year, it is stated, equipment maintenance costs were reduced $231,671 by improved efficiency and by retiring obsolete equipment Transportation costs were reduced $213,962 while new records of operating performance were being established. There was an increase of $49,339 in maintenance of way expenditures, reflecting the program to extend the improvement of roadbed and bridges.

State Control of Aviation Suggested

State control of aviation lines carrying passengers in California has been recommended to the state railroad commission in a report submitted by J. G. Hunter of the commission's transportation department, and Charles G. Shone, assistant engineer. The report was taken under consideration by the commission, and the legal department was ordered to prepare an opinion on the powers of the commission to regulate flying.

The report pointed out that already there are 11 air lines in operation carrying passengers throughout the state, and several others will begin operations this summer. Three lines will operate between San Francisco and Los Angeles, and all will use cabin planes, and three of the 11 lines are operated with multi-motored planes.

As an example of the growing importance of air transportation, the report cited the plans of the Western Air Express to install 15-passenger planes with three motors, generating a total of 1200 horsepower and giving three-hour service between Los Angeles and San Francisco.

Pennsylvania is the only state that has thus far adopted regulatory provisions, the report stated.

To Build to Sprague River

The Great Northern and Southern Pacific, joint owners of Oregon, California & Eastern, have decided after a conference of executives to rebuild the 40-mile line which runs from Klamath Falls to Sprague River.

B. C. Gilman, vice president of Great Northern, and Paul Shoup, executive vice president of Southern Pacific, had gone over the situation. Engineers have been instructed to prepare plans. The line originally was built by P. E. Strahorn and taken over by Southern Pacific-Great Northern as joint owners under an order of the Interstate Commerce Commission permitting the Great Northern to enter the Klamath Basin.

Texas Electric After Freight

An amendment to the charter of the Texas Electric Railway, which operates 279 miles of interurban electric lines out of Dallas, has been filed in the secretary of state's office, providing for establishing freight service. This action automatically placed the system under the jurisdiction of the railroad commission. It is planned to start fast freight

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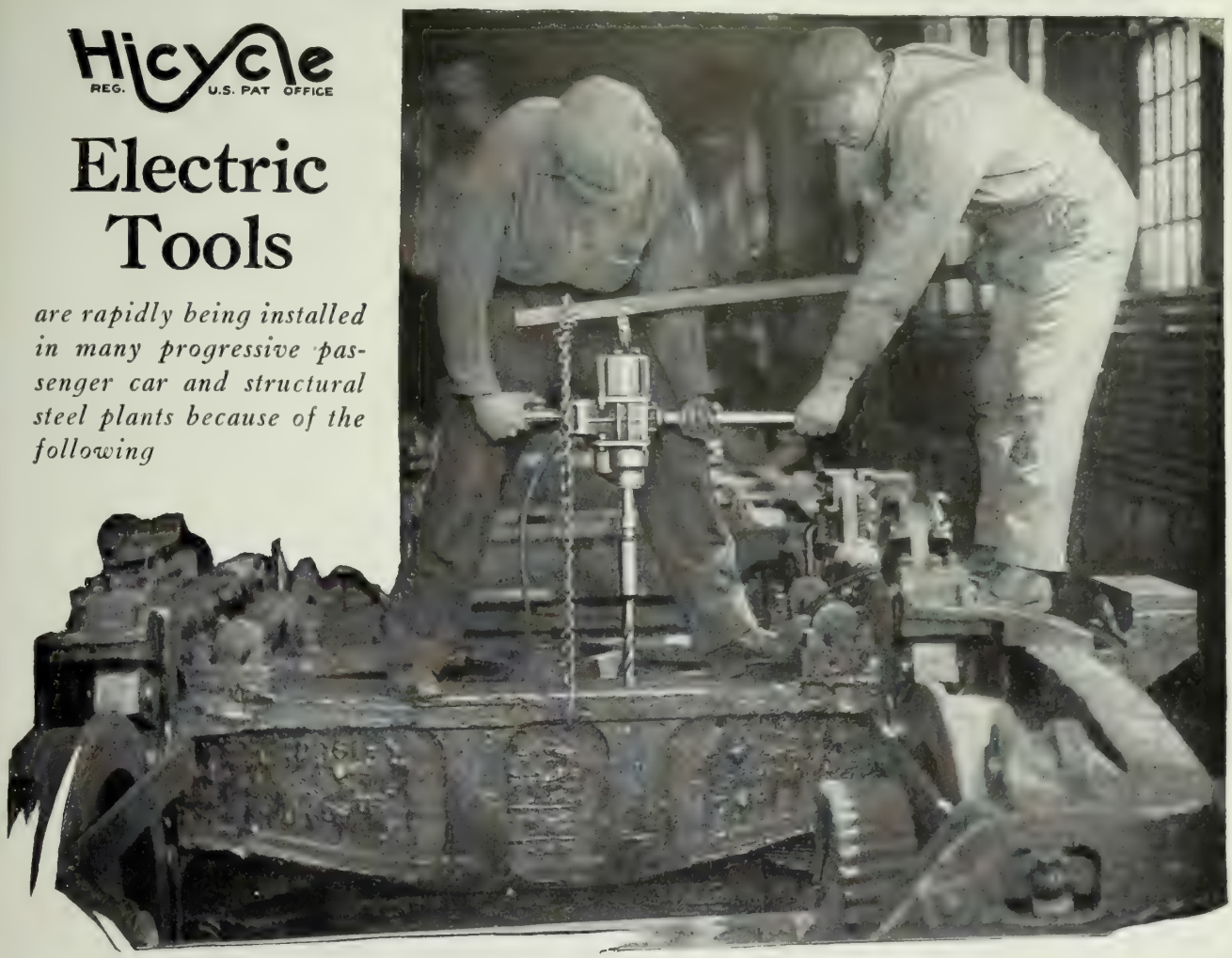
are rapidly being installed in many progressive passenger car and structural steel plants because of the following



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Hicycle tools HAVE GREATER POWER due to high sustained speed under load.

Above photograph shows a No. 1 Hicycle Drill, weighing but 23 lb., drilling ⅞ in. holes through 1 in. steel on a motor truck. (Taken in the plant of one of America's largest car builders.) A 50-lb. Direct Current Drill was formerly used for this operation.

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1904: Introduced the first portable electric tool using a fan for forced air circulation for cooling.

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service over the three lines as soon as schedules can be worked out.

The new branch of service has been found necessary to build revenues to a supporting volume, now hardly reached in the passenger and express services. Under its application to be recognized as a common carrier the company asked for the approval of its passenger rates, declared lower than those charged by steam lines, and the right to use the commission's freight rates, as used by steam roads.

Rate Increase Denied

The petition filed by southwestern carriers for a general 10 per cent increase in freight rates has been denied by the I.C.C. in a supplemental report, which in addition made numerous changes consisting largely of individual rates and groupings and are designed to simplify and bring into proper relationship various commodities and classes.

In the supplemental report the commission passes on and disposes of a large number of petitions for reconsideration, reopening or modification, filed by shipping interests and carriers. Though the new report carries a number of changes, they are largely changes in details. The commission does not disturb its general rate adjustment plan for the Southwest as provided by the original report.

Missouri Pacific Shows More Prosperity

New industrial enterprises located on Missouri Pacific tracks in 1927 reflect a satisfactory and progressive attitude in further development along the same lines for 1928. Despite flood disaster throughout the Middle West, 487 new industries were located along Missouri Pacific last year. In 1926 there were 635, the greatest number of industries established in any year in the history of the road. While the number in 1927 was less, the total investment of $23,245,000 was greater by $88,000 than that of the previous year.

Combined estimated output of the 487 new industries is 96,236 carloads annually, according to L. W. Baldwin, president. In preparing transportation facilities it was necessary to construct 172 tracks with a total length of 15.9 miles at a cost of $244,000.

Cascade Tunnel Workers See Through

President Coolidge who has pressed buttons starting nearly everything except the present campaign, pushed down another, May 1, and in doing so turned loose a blast that broke through the remaining wall between the two ends of the Cascades tunnel. The tunnel is being constructed by the Great Northern Railway at a cost of $16,000,000. Electrification and line changes will bring the total expenditure to $25,000,000.

After the 400 pounds of dynamite was set off by the President officials of the railroad, contractors and newspaper men walked through the last barrier.

The tunnel is 100 miles east of Seattle and is 7.79 miles long. It will eliminate curves aggregating more than six complete circles, lower the maximum elevation of the road 500 feet and shorten the line eight miles.

In December, three years after construction was begun, it is planned for the first train to run through the underground channel.

Railways Ask Short Wave Radio

A suggestion has been made to the federal radio commission by the radio committee of the American Railway Association that "one or more blocks" be reserved for train communication equipment, to be located at the discretion of the commission within the short wave band from 2250 to 2750 kilocycles and having a total minimum width of approximately 144 kilocycles.

"It should be borne in mind that the range of the train telephone equipment is extremely limited, being in the order of five miles," the association said.

The interference range to sets of like sensitivity is presumably of the order of about ten miles, the association said, whereas "beat note interference" to receivers of the highest sensitivity operating in the same band may be somewhat extended."

River Traffic to Resume

River navigation, which vied with the covered wagon for traffic supremacy in the northwest years ago, is coming back in this region, says a message from Minneapolis.

On the Mississippi River big tow boats are arriving and departing regularly with capacity freight cargoes. Federal permission to operate boats on the stream is all that stands in the way of a vessel line on the St. Croix, and there is talk of a freight carrying line on the Minnesota, which, like the St. Croix, is a tributary of the Mississippi.

Both lines would operate as feeders to the Mississippi River barge system. The St. Croix extends northward and the Minnesota southward from the vicinity of the Twin Cities.

Car Movement Some Slower

The average daily movement per freight car in February was 29.8 miles, the bureau of railway economics reports. This was a decrease of six-tenths of a mile below the same month in 1927 but an increase of 1.2 miles above that for February, 1926. In computing the average daily movement, account is taken of all freight cars in service, including cars in transit, cars in process of being loaded and unloaded, cars undergoing or awaiting repairs and also cars on side tracks for which no load is immediately available. The average load per car in February was 26.6 tons, including less than carload lot freight as well as carload freight, a decrease of 1.4 tons under the same month last year and six-tenths of a ton below February, 1926.

Not So Many Cars Are Available

Class I railroads had 340,608 surplus freight cars in good repair and immediately available for service April 22, the car service division of the American Railway Association announces. This was a decrease of 10,320 cars compared with April 15, at which time there were 350,928 cars.

Surplus coal cars totalled 159,428, on April 22, a decrease of 11,964 cars within approximately a week while surplus box cars totaled 132,049, an increase of 2,665 for the same period. Reports also showed 22,937 surplus stock cars, a decrease of 1,921 cars under the number reported on April 15, while surplus refrigerator cars totaled 14,900, an increase of 1,184 for the same period.

Depew's Position Abolished

The post of chairman of the board of directors of the New York Central, held for more than a quarter-century by the late Chauncey M. Depew, never will be filled.

Directors voted recently to discontinue that office. It also was voted to change the title of the finance committee to executive committee.

Net Ton Miles Lower

For the first two months in 1928, the volume of freight handled by Class I railroads amounted to 71,967,625,000 net ton miles. This was a decrease of 4,523,679,000 net ton miles or 5.9 per cent below the same period last year. Railroads in the eastern district for the two months period reported a decrease of 10.7 per cent in the volume of traffic compared with the same period in 1927, while the southern district reported a decrease of 8.2 per cent. The western district reported an increase of 2.5 per cent.

Fewer Accidents in 1927

Reductions in 1927 compared with the year before not only in the number of highway grade crossing accidents but also fatalities resulting therefrom, have just been reported by the railroads to the Interstate Commerce Commission.

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Indispensable in mines,
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Built in Standard and Narrow Gauge Sizes

Persons killed in 1927 as a result of such accidents totaled 2371 or a reduction of 120 compared with 1926, while 6613 persons were injured, which was a reduction of 378 compared with the preceding year. Reports showed 5640 accidents at highway grade crossings during the past year, a reduction of 250 under 1926. This decrease in the number of fatalities resulting from highway grade crossing accidents took place despite the fact that there are now more than 23,000,000 motor vehicles in operation or an increase of 5 per cent over the number in 1926.

Contracts for Vessels

On April 1, 1928, American shipyards were building or under contract to build for private shipowners 347 steel vessels of 202,598 gross tons compared with 283 steel vessels of 179,502 gross tons on March 1, 1928, according to the bureau of navigation, department of commerce.

There were 72 wood vessels of 29,269 gross tons building or under contract to build for private shipowners during the same period compared with 67 wood vessels of 27,243 gross tons on March 1, 1928.

Milwaukee's Earnings Grow

Gross revenue and net railway operating income of the Milwaukee for March, will show an increase over a year previous, according to preliminary estimates. An increase over March, last year, when gross revenue was $13,209,105 and net railway operating income $1,311,386, would represent the third time this year that earnings exceeded the same month last year. For the first two months, gross and net were $24,663,211 and $3,771,382, respectively, compared with $23,382,256 and $1,472,999, respectively, in the same period last year. Earnings in the first two weeks of April ran ahead of last year.

L. A. Ry. Earnings Gain

Although operating revenue of the Los Angeles Railway Corpn. showed an increase in 1927, the company's gross corporate income suffered in comparison with the 1926 figures, according to the annual statement filed with the railway commission.

Operating revenue for 1927 was reported at $13,287,600 against $13,021,482 the year before, but expenses rose from $10,930,998 to $11,062,012.

After taxes, operating income rested at $1,411,240 for 1927 against $1,282,558 the year before.

Two Eager to Give Service

A struggle between the Pickwick Stages and the Motor Transit Co. on one hand, and the Pacific Coast Motor Coach Co. and the Santa Fe on the other, is seen in two applications made to the state railroad commission for the right to run stages on the coast highway.

These applications are to come before a representative of the railroad commission on May 17 at Newport Beach, Cal., when it is expected that representatives of chambers of commerce and other bodies from all along the south coast will attend.

M. & St. L. Final Valuation $45,403,000

The Interstate Commerce Commission has placed final valuation of $45,403,000 on the owned and used property of Minneapolis & St. Louis Railroad as of June 30, 1917. Owned but not used property was given a valuation of $1,010,833 and the used but not owned, $84,548.

Americans Help Build in Persia

A contract for the construction of the Persian Gulf-Caspian Sea Railway will be awarded by the Persian government to a consortium composed of Ulen & Co., New York; Julius Berger Tiefbau, A. G., of Berlin; Philippe Holtzman, A. G., of Frankfurt and Siemans-Bau Union G.M.B.H. of Berlin. The line will be about 1600 kilometers long.

Great Western New Safety Record

The western division of the Chicago Great Western Ry., just closed a period of 195 consecutive days without a reportable injury. This beats all previous records for an operating division on the Chicago Great Western, and so far as can be learned, this record has never been equaled by a division on any American railroad.

K. C. S. Financing

The Kansas City & Grand View Ry. has applied to the Interstate Commerce Commission for authority to issue $3,000,000 first mortgage bonds to be sold at 94½ and proceeds used to pay off indebtedness to the Kansas City Southern Ry. and to pay cost of construction and equipping its line which extends from Leeds to Grand View, Mo., a distance of 13 miles. The issue will be guaranteed by the Kansas City Southern which owns the capital stock of the Grand View line. At the same time the Kansas City Southern asked for authority to lease the short line.

St. Louis Traffic Club Elects

New officers for the year were announced May 1 by the St. Louis Traffic Club. They are: President, J. N. Cornatzar, passenger traffic manager, Frisco System; vice presidents, George E. Goodwin, traffic manager, Liggett-Meyers Tobacco Co.; Edward Clemens, traffic manager, Terminal Railroad; Edward C. Fisher, district sales manager, American Locomotive Co.; C. P. Bowsher, division freight agent, M. K. & T.; Hupp Tevis, Jr., vice president, Tevis Transfer Co.; secretary, Sherman E. Wilson, assistant traffic manager, Chevrolet Motor Car Co.; treasurer, A. H. Kilinger, traffic manager, Laclede Christy Co. The new members of the board of directors are former president W. R. Huey, traffic manager, Bemis Bros. Bag Co., Geo. A. Bode, freight traffic representative, Missouri Pacific, Frank Mullivan, traffic manager, Crunden-Martin, J. C. Sartelle, general agent, Santa Fe, and A. M. Field, traffic manager of the Wrought Iron Range Co.

B & M Employes' Fund

The Boston & Maine Employes' Fund has been incorporated and five trustees selected. They are, Homer Loring, chairman; President George Hannauer, W. Rodman Peabody of Boston, member of the board of directors; Cameron MacKay of Somerville, who is a passenger conductor on the Portland division, and Joseph M. Sullivan of Charlestown, who is passenger trainmaster, Terminal division.

The employes' fund has been made possible through the gift of $100,000 by Mr. Loring, to whom that amount had been voted by the directors of the Boston & Maine for his work of rehabilitation. Mr. Loring accepted the money only to turn it over to the employes' fund. The specific application of this fund will be determined later.

Pacific Railway Club Resumes

The Pacific Railway Club held its first meeting under its new officers April 12 at the Hotel Oakland, Oakland, Cal. President F. E. Yoakum presided and announced the appointment of committee chairmen as follows:

J. B. Baker, first vice president, was appointed chairman of the attendance and reception committee.

J. P. Quigley, second vice president, was appointed chairman of the membership committee.

President Yoakum and Secretary Wollner will be the subject committee.

Douglas W. Dodge was appointed chairman of the finance committee.

The related topics of the evening were self-propelled rail cars, and terminal motor service. Addresses on rail cars were given by Frank C. Bryant of the Electro-Motive Co., Douglas W. Dodge of J. G. Brill Co. and Allen H. Babcock, chief electrical engineer of the Southern Pacific. Terminal motor service was presented by W. P. Scott, president of the Drayage Service Corpn., which is providing terminal drayage service in the

San Francisco Bay region under contract with all the railroads and which is planning to extend its operations to other cities on the Pacific Coast. An interesting feature of the evening was an impromptu address by Colonel Hall, internationally famous as a combustion engine designer.

The club's next meeting, May 10, is to be held at the Hotel Oakland, Oakland, Cal. The chief topic will be the detailed costs of yard operation. The speakers are to be J. P. Quigley, superintendent of transportation and telegraph, Western Pacific Railroad Co.; W. E. Bowen, general yardmaster, Oregon Short Line, Salt Lake City; J. G. Nolte, assistant trainmaster, Western Pacific, Stockton, and others. For the first time on the Pacific Coast, a motion picture will be shown depicting electro-pneumatic car retarders in yard service.

Railroads Urged to Use Air Auxiliary Service

About 800 persons, members and guests of the Western Railway Club, heard two addresses emphasizing the modern ideas in transportation progress at the annual banquet given, the evening of May 7, at the Hotel Sherman, Chicago. The banquet was given in conjunction with the twentieth annual convention of the International Fuel Association. W. P. MacCracken, Jr., assistant secretary of commerce, division of aeronautics, spoke on "Aviation as a Transportation Agency," and T. C. Powell, president of the Chicago & Eastern Illinois, on practically the same subject with differences in treatment. W. G. Black, mechanical assistant to the president of the Erie Railroad, president of the club, presided.

Mr. MacCracken urged the establishing of air lines by railroads as supplements to rail service. This service, he said, should be developed along four distinct lines, passenger, mail, express and light freight. "The airplane is the most flexible means of transportation," he said. "Planes can be shifted easily from one route to another, which practically eliminates the problem of car shortage."

Mr. MacCracken described the elements entering into the development of air service as speed, reliability, safety and cost. Airplane speed, he said, is from 80 to 100 miles an hour, and in another year or two this will be increased to 125 miles an hour. Multimotors are developing reliability. Air mail, he said, has a grand average record of being 90 per cent on time. As to safety, airplanes such as the established companies use are as safe as travel by rail, and 30 insurance companies now offer to insure passengers and pilots of licensed companies. Money is now made for carrying mail at ten cents for a half ounce, and congress is considering a bill providing for a rate of five to ten cents for the full ounce. Airways are maintained by the government.

T. C. Powell, president of the Chicago & Eastern Illinois, believed that commercial aviation will supplement, rather than compete with the railroad. "The airplane," he said, "is not a substitute for other forms of transportation, but an ally."

In this connection it is interesting to know, as this magazine has just been advised by President Baldwin, that the Missouri Pacific has appointed a committee of its officers to study aviation in the light of present and prospective developments. C. E. Perkins, traffic vice president, is chairman of this committee, and J. G. Drew, vice president, and R. C. White, assistant general manager, the members assisting.

Western Pacific Traffic Is Growing

Traffic on the Western Pacific for 1927 showed a healthy increase over 1926, and traffic for the first 70 days of 1928 showed a good increase over the corresponding period of 1927, J. P.

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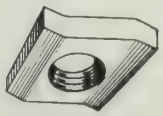

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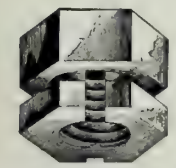

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'RALSTON BUILT'

Steel and Composite Cars

Completely rebuilding large numbers of steel cars in record time is an achievement that Ralston Steel Car Company has repeated time and time again.

This is possible only through our excellent facilities and well-balanced program, which, together with skilled workmen and competent engineers, keep the cars moving through the plant on regular schedule.

THE RALSTON PLANT is equipped to build New Cars, to Rebuild Old Cars, to Repair and to supply repair parts. All materials and work of the highest QUALITY and performed under expert Engineering Supervision.

RALSTON STEEL CAR CO.
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Quigley, superintendent of transportation of the railroad, reported to the Pacific Coast transportation advisory board.

Chicago Traffic Club Elects

At the annual election of the Traffic Club of Chicago held in the club rooms, Tuesday, March 27, the following members were elected to office for the ensuing club year:

President—M. H. Kennelly, president, Werner Bros. Fireproof Storage Co.

First vice president—Allen R. Gould, A. F. & P. T. M., Chicago & North Western Railway.

Second vice president—C. T. Bradford, manager traffic department, International Harvester Co.

Third vice president—H. R. Kurrie, president, Chicago, Indianapolis & Louisville Ry.

Secretary—H. E. MacNiven, agent, New York Life Insurance Co.

Treasurer—J. H. Howard, assistant to vice president traffic, C. M. St. P. & P. R. R. Co.

Directors for two years—A. E. Clift, senior vice president, Illinois Central; E. R. Newman, special traffic representative, Wabash Railway; Roy W. Campbell, manager traffic department, Butler Paper Corpn.; Richard Hackett, vice president, Judson Freight Forwarding Co.

Lamme Award For Engineers

At Ohio State University a gold medal will be awarded this spring for the first time from the Lamme Foundation. Benjamin Garver Lamme, an alumnus of the class of '88, is the donor. The medal, which contains $100 worth of gold, is to be awarded every five years to a graduate in any branch of engineering at the Ohio University.

Mr. Lamme, for over 30 years the directing factor in the engineering of the Westinghouse Electric and Mfg. Co., has received the Edison medal awarded by the American Institute of Electrical Engineers and the Sullivant medal awarded five years ago for the first time at Ohio State University.

Here's a New Way to Regulate

Shattering all precedents, the senate has appealed to the Supreme Court to allow Donald R. Richberg, counsel for the national conference for railroad valuation, to present a brief in behalf of the Interstate Commerce Commission in the famous valuation test case involving the St. Louis & O'Fallon R. R.

A resolution, sponsored by Senator Norris of Nebraska, was adopted, 46 to 31. The opposition declared the senate's action would be an interference with the judicial functions of the court.

Railway Construction

Tracks & Yards

CALIFORNIA.—The Western Pacific intends to widen the subgrade between Oakland and Sacramento at a cost of $160,000. It plans to construct additional passing tracks between Oroville and Portola, to replace bridges, and to improve yard tracks, depot facilities and industrial and team tracks.

IDAHO.—The Union Pacific proposes construction of ten miles of second main track on the Oregon Short Line between King Hill and Ticeska.

MISSOURI.—The Kansas City Southern plans the construction of a 13-mile line between Leeds and Grandview, at a cost of about $3,000,000, it is reported.

MONTANA.—The Great Northern has awarded the contract for the 70-mile branch between Saco and Turner to A. Guthrie & Co., St. Paul to cost about $2,000,000. Track will be completed in time to move the wheat crop of 1928.

NEVADA.—Examiners for the I. C. C. recommend the Western Pacific be allowed to construct a 6,200-ft. extension at Wells to connect with a branch line of the Oregon Short Line.

NEW YORK.—The Long Island will eliminate 31 grade crossings here at a cost of about $8,000,000, it is reported. The 27 crossings between Rockaway Park and Arverne will cost about $6,500,000 and the four in Corona about $1,400,000.

OREGON. — The Oregon-Washington Railroad & Navigation Co. is preparing to widen cuts and restore embankments between Meacham and Huron, and additional storage tracks at Albina.

Buildings & Structures

CANADA.—Manitoba, Elkhorn. The Canadian Pacific has let a contract to Macaw & Macdonald, Winnipeg, to build a 100-ton coaling station.

ILLINOIS.—Chicago. The Ready Coal & Construction Co., Chicago, has a contract from the Pennsylvania for paving at the 47th st. subway, to cost about $25,000.

—Stoneport. The Illinois Central has let a contract to Joseph E. Nelson & Sons, Chicago, for a water treating plant, capacity 150,000 gal. a day, to be equipped with pumps capable of handling 500 gallons a minute.

INDIANA.—Cedar Lake. The E. B. Styles Contracting Corpn., Chicago, has a contract from the Chicago, Indianapolis & Louisville for concrete abutments for a steel span over a highway here.

—Lafayette. The Chicago, Indianapolis & Louisville has let a contract to Fairbanks, Morse & Co., Chicago, for a 500-ton reinforced concrete automatic electric coaling station.

KANSAS.—Great Bend. The Santa Fe has awarded a contract to the Roberts and Schaefer Co., Chicago, for a 300-ton capacity, 3-track simplex automatic electric reinforced concrete locomotive coaling plant and a 50-ton Rands gravity sand drying plant.

—Marysville. The Union Pacific is planning to build a passenger station, it is reported.

MAINE.—Bangor. The Maine Central will extend the second and third sections of its enginehouse here to a depth of 90 feet, it is reported, at a cost of about $40,000.

—Waterville. The Maine Central has awarded a contract to the Truscon Steel Co., Boston, for two steel buildings here. The brick walls and foundations will be constructed by the John H. Simonds Co., Portland, Me.

MARYLAND.—Baltimore. The Pennsylvania has awarded a contract to the Arundel Corpn., Baltimore, for an undergrade bridge at Lakewood ave., to cost about $125,000.

MASSACHUSETTS. — East Deerfield. A contract has been given the Roberts & Schaeffer Co., Chicago, by the Boston & Maine for a 500-ton capacity, 4-track reinforced concrete simplex automatic electric locomotive coaling plant, to be built here.

NEBRASKA.—Gering. The Union Pacific plans a passenger station and engine terminal, it is reported.

NEW YORK.—Harmon. The New York Central has let a contract to the Union Iron Works, Inc., New York, for pulverized coal burning boilers here.

—New York City. The New Haven will construct a brick and steel building 106x376 feet at Van Nest Shops to cost

about $250,000. The contract was let to Babor-Comeau & Co., New York.

—Port Morris. The New York Central has let a contract to Babor-Comeau & Co., Inc., for a poultry terminal building and platform.

—Tarrytown. The New York Central has let a contract to the Walsh Construction Co., Syracuse, for the reconstruction of bridges here and at Tivoli.

—Tivoli. See Tarrytown.

NORTH DAKOTA.—Grand Forks. The Great Northern has let a contract to Carl Steen for an extension to the enginehouse here.

OHIO.—Toledo. The Baltimore & Ohio has awarded a contract to the Roberts & Schaefer Co. for a 300-ton capacity, 3-track reinforced concrete simplex automatic electric locomotive coaling plant, a 150-ton capacity reinforced concrete Rands gravity sand drying plant, and a N. & W. type, large capacity, 4-track multiple pit cinder handling plant. These will be built at the Rossford terminal.

PENNSYLVANIA.—Pittsburgh. The Pennsylvania has completed plans for a $5,000,000 freight and produce terminal on the Allegheny River between 11th and 21st streets. The package platform will be 1250 by 100 ft. with facilities for unloading 112 cars at once. Team track space will be provided for 450 cars with storage and inspection trackage for 350 more cars. There is to be also a storage yard at 43rd st. to handle 435 more cars.

—Grapeville. The Pennsylvania will construct an undergrade bridge here to eliminate two grade crossings. Contract was let to John F. Casey Co., Pittsburgh.

—Philadelphia. Sinclair & Grigg have a contract from the Pennsylvania for a new coal dumper pier on the Delaware River south of the Greenwich terminal yard. Estimated cost is $600,000.

UTAH.—Cisco. Contract water treating plants here, at Farnham, at Helper and at Green River has been awarded the Sterans-Rogers Mfg. Co., Denver.

VIRGINIA.—Norfolk. The Pennsylvania has awarded a contract to the Blaw-Knox Co., Pittsburgh, for an enginehouse.

WASHINGTON.—Wenatchee. The Great Northern has awarded a contract to W. T. Butler, Seattle, for a brick and steel shop to have outside dimensions of 82 by 192 ft.

Locomotive Orders

According to the A.R.A., Class I railroads placed in service 465 locomotives in the first three months this year. This was an increase of 18 locomotives compared with the corresponding period last year, but a decrease of 105 compared with the same period in 1926. For March alone, the railroads installed 140 locomotives compared with 142 in March the year before. Locomotives on order April 1 this year totaled 137 compared with 244 on the same date last year.

Locomotives in need of repair April 15, totaled 8,999 or 15 per cent of the number on line, 5,067 or 8.5 per cent in need of classified repairs, and 3,932 or 6.5 per cent in need of running repairs. This was an increase of 712 locomotives compared with the number on April 1. Serviceable locomotives in storage April 15, totaled 7,249 compared with 7,276 on April 1.

The Erie is inquiring for 35 2-8-4 locomotives and one oil electric locomotive, and will recondition and modernize about 75 locomotives. The Cleveland Union Terminals Co., is inquiring for 25 electric locomotives, and the Dominion Coal Co., for one locomotive. Orders placed with Baldwin since our previous issue include those of the Southern Pacific for three Pacific and 10 Mallets; Tampanga Sugar Development Co., Philippine Islands, two Moguls; Chicago, St. Paul, Minneapolis & Omaha, eight switchers, and the Texas & Pacific, five Mountain type. The Canadian Pacific ordered 25 Mikados, from American, through the Montreal Locomotive Works Ltd.; the Texas & Pacific, 15 Texas type from Lima; and the Great Northern two electric locomotives from Baldwin and Westinghouse Electric & Mfg. Co.

Passenger Car Orders

The outstanding order of the month was that of the New York Central for 120 cars, awarded as follows: 34 cars to the American Car & Foundry Co., 5 cars to the Pressed Steel Car Co., 25 cars to the Pullman Car & Mfg. Corpn., 16 cars to the Osgood-Bradley Car Co., 10 cars to the Standard Steel Car Co., and 30 cars to be built in the company shops. The Richmond, Fredericksburg & Potomac ordered one cafe car from the Pullman Car & Mfg. Corpn., the Delaware, Lackawanna & Western, one combination baggage and mail car from the American Car & Foundry Co., the Illinois Central, 10 motor cars and ten trailers from the Pullman Car & Mfg. Corpn., the Pullman Company, 100 sleeping cars from the Pullman Car & Mfg. Corpn., the Union Pacific, two gas electric rail motor cars from the J. G. Brill Co., the Rock Island, 11 gas electric rail motor cars, three to be built by the Mack-International Motor Co., and the Cummings Car & Coach Co., and eight by the Electro-Motive Co., and the St. Louis Car Co., and the Cleveland Railway, 49 cars from the Kuhlman Car Co. The Rock Island also ordered six power units from the Electro-Motive Co., to be installed in existing cars, two plants to a car, and the Union Pacific is converting two McKeen cars to gas electric.

Several large inquiries have been made since our previous issue. The Southern Pacific is inquiring for 25 coaches, 5 three-compartment coaches, 10 baggage cars, 6 combination baggage and mail cars and 6 dining cars; the Erie, 25 passenger cars, 3 combination baggage and mail cars, 5 express cars and 2 dining cars; the North American Car Co., 50 express refrigerator cars; the Baltimore & Ohio, 10 combination baggage and

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mail cars; the Rock Island, 5 horse express cars; the Chicago, South Shore & South Bend, 10 motor cars with an option on five additional cars and five trailers; and the New Haven for 50 to 100 underframes.

Freight Car Orders

A recent statement issued by the car service division of the A.R.A. shows that 10,064 freight cars were installed in service by the Class I railroads during the first three months this year. This is a decrease of 5,732 compared with the number installed in service during the corresponding period last year. Freight cars installed in March this year totaled 4,032 compared with 5,175 in March, 1927. The railroads on April 1, had 25,248 freight cars on order compared with 27,255 on the same date last year and 49,524 on the same date in 1926.

The largest inquiry since our previous issue was that of the Erie for 500 box cars, 400 automobile cars, 100 automobile furniture cars, and five special flat cars. This company will also have 2,485 box cars repaired. Other inquiries are: Barrett Co., 100 insulated tank cars; C. M. St. P. & P. two flat cars, Southern Cotton Oil Co. 20 tank cars, Southern Pacific 50 caboose cars, United Sugar Co. of Mexico 10 cane cars; Frisco two underframes and superstructures for automobile cars; Chicago & North Western, 200 flat cars; and the Virginian Railway, 1000 hopper car bodies.

The Atlantic Coast Line ordered 200 phosphate cars from the Tennessee Coal, Iron R. R. Co.; Standard Oil Co., of N. J., six box cars from the Pressed Steel Car Co.; Consolidated Coal Co., 150 mine cars from the Bethlehem Steel Co.; Southern Pacific, 175 tank cars from the General American Tank Car Corpn., and 250 automobile cars from the Tennessee Coal, Iron & R. R. Co.; Pennsylvania Salt Mfg. Co., two tank cars from the General American Tank Car Corpn.; North American Car Corpn., 200 poultry cars from the Standard Steel Car Co.; North Western Refrigerator Line Co., 500 refrigerator cars and 100 underframes from the American Car & Foundry Co.; Chicago & North Western, 300 general service cars from the Siems-Stembel Co.; Amtorg Trading Corpn., 16 flat cars from the Magor Car Corpn.; Pacific Fruit Express, 400 underframes for refrigerator cars from the Pacific Car & Foundry Co., the Cudahy Packing Co., 100 underframes from the Pullman Car & Mfg. Corpn; and the Rock Island, 500 underframes from the Pennsylvania Car Co. The Burlington is rebuilding 250 ballast cars in its own shops, and the Canadian Pacific is building 40 caboose cars in its Angus shops.

Bus and Truck Orders

Among the recent bus orders and deliveries are the following: Boston & Worcester Street Ry., Framingham, Mass., two Mack parlor cars with Lang bodies; Boston & Maine, five A. C. F. 29-passenger parlor observation coaches; Boston & Maine Transportation Co., nine type-Y yellow parlor coaches; Boston Elevated Ry., four A. C. F. gas electric metropolitan coaches and one White model 50b coach; Boston, Revere Beach & Lynn, one 29-passenger A. C. F. de luxe urban coach; Interstate Street Ry., Attleboro, two 27-passenger A. C. F. parlor coaches; New England Transportation Co., six Mack chassis with Brown bodies, 14 type-Y Yellow parlor coaches and 15 29-passenger A. C. F. parlor observation coaches; Chestnut Ridge Transportation Co., Derry, Pa., two 21-passenger A. C. F. parlor coaches; Citizens Traction Co., Oil City, Pa., 10 23-passenger buses; Public Service Coordinated Transport, Newark, N. J., three Mack 29-passenger city type buses and five White model-53 coaches; Ohio Valley Bus Co., Huntington, W. Va., two Studebaker 20-passenger buses; Northern Ohio Power & Light Co., 10 street car Twin coaches and six parlor car Twin coaches; Illinois Power & Light Corpn., five 30-passenger A. C. F. urban coaches and one Mack 29-passenger parlor car coach; Lincoln Traction Co., Lincoln, Neb., two Mack 29-passenger city type buses; Grand Canyon Transportation Co., eight White model-53 parlor coaches; Texas Motor Coaches, Fort Worth, six Mack parlor cars with Lang bodies; Wichita Falls Traction Co., two Mack 25-passenger city type buses; San Antonio Public Service Co., 10 White coaches; Houston Electric Co., four Twin coaches.

Changes in Personnel

Executive and Operating

George B. Elliott, vice president and general counsel of the Atlantic Coast Line, has been elected president to succeed John R. Kenly, who died March 1. Mr. Elliott has been with this line since his graduation from Harvard Law School in 1896, when he was appointed special attorney. He has held successively the positions of assistant general counsel, general counsel and vice president.

P. R. Albright, vice president and general manager of the Atlantic Coast Line, has been appointed vice president in charge of operation. **J. N. Brand,** assistant general manager, has been appointed general manager.

William L. Oldroyd has been appointed assistant to the vice president of the Boston & Albany, with headquarters at Boston.

H. C. Murphy has been appointed superintendent of the Centerville divisior of the Burlington, with headquarters at Centerville, Ia., vice **S. L. Fee,** transferred. **W. E. Haist** succeeds Mr. Murphy on the staff of the general manager, and will handle special matters. **F. E. Sperry** has been appointed trainmaster on the Galesburg division, with headquarters at Galesburg, Ill., to succeed **L. F. Parks,** resigned. **F. B. Leonard** has been appointed trainmaster on the Ottumwa division with headquarters at Ottumwa, Ia., vice **H. J. Hoglund,** promoted.

George F. Squires, assistant freight traffic manager of the Pacific Electric, has been appointed general manager of the Harbor Belt Line, Los Angeles Harbor, formed by a consolidation of the Southern Pacific, Union Pacific, Santa Fe and Pacific Electric. Mr. Squires will have charge of freight operations at the harbor. He began railroad work with Pacific Electric, then the Los Angeles Pacific, at the age of 15.

Harry Scullin, J. J. Mitchell, Jr., and **J. Williams** have been elected directors of the Chicago & Alton, succeeding **F. Wade, J. J. Mitchell, Sr.,** and **V. D. Shipworth.**

L. A. Anthony, superintendent of car service of the Boston & Albany, with headquarters at Springfield, Mass., has retired from service and will be succeeded by **C. W. Cummings.**

H. D. Earl, general superintendent of the Texas & Pacific, with headquarters at Dallas, has been named general manager.

The Erie announces that **L. L. White,** superintendent of the Chicago division, has been transferred to the new Marion division, a consolidation of the Marion and Chicago divisions, with headquarters at Huntington, Ind. **R. C. Randall** has been named assistant superintendent, with headquarters at Chicago.

R. Vawter, assistant trainmaster of the Logan coal division of the Chesapeake & Ohio, with headquarters at Peach Creek, W. Va., has been transferred to the Sewell Valley division with head-

quarters at Rainelle. **R. N. Lynch** has been named to succeed Mr. Vawter at Peach Creek.

P. L. Clarity, superintendent of the Minneapolis passenger station of the Great Northern, retired from active service March 12.

M. H. Cahill, vice president in charge of operation of the Seaboard Air Line, with headquarters at Savannah, has been granted a leave of absence, and departments reporting to him will now report to **E. C. Bagwell,** recently elected operating assistant to the vice president.

James T. Gillick, chief operating officer of the Milwaukee, with headquarters at Chicago, has been elected vice president in charge of operation. Mr. Gillick has been with this road since he was 15 years old, and has held, successively, the positions of telegraph operator, train dispatcher, chief dispatcher, trainmaster, superintendent, assistant general manager and general manager.

Henry E. Pierpont, chief traffic officer of the Milwaukee, with headquarters at Chicago, has been elected vice president in charge of traffic. Mr. Pierpont has been with this road nearly 45 years. Like Mr. Gillick, he started as a telegraph operator; he held various positions in the traffic department including general freight agent, freight traffic manager, and traffic manager.

L. O. Murdock, division superintendent of the Burlington, with headquarters at Alliance, Neb., has been elected assistant to the vice president, with headquarters at Chicago, vice **D. H. Bremerman,** resigned.

Howard L. H. Blair, assistant to the general manager of the central region of the Pennsylvania, with headquarters at Pittsburgh, has retired after nearly 50 years' service.

William H. Williams resigned May 7 as vice president and a member of the board of managers of the Delaware & Hudson to devote his time to the Missouri Pacific and the Wabash in both of which companies he is chairman of the board. He has also been elected chairman of the board of directors of the D. & R. G. W.

T. M. Schumacher, former chairman of the board of the Denver & Rio Grande, has been elected chairman of the executive committee.

Philip E. Pfeifer, recently appointed assistant to the general manager of the Boston & Maine, has been promoted to assistant general manager in charge of train operation with headquarters at Boston.

The Oregon, California & Eastern announces the election of **Thomas Ahern,** assistant general manager of the Southern Pacific with headquarters at Sacramento, as president; **J. H. O'Neill,** general manager of the western lines of the Great Northern with headquarters at Seattle, vice president; **N. H. Bogue,** general manager and chief engineer with headquarters at Klamath Falls, Ore.; **J. Wagner,** auditor and secretary with headquarters at Klamath Falls; **Pearle Collister,** treasurer, with headquarters at Klamath Falls.

C. E. Bickel, general superintendent of the Litchfield & Madison with headquarters at Edwardsville, Ill., has been given a leave of absence on account of illness. The position will be filled temporarily by **Frank Walker,** who has been given a leave of absence from his position as trainmaster of the Springfield district of the Illinois Central.

W. B. Harris, transportation assistant in the Manitoba district, has been granted a leave of absence by the Canadian Pacific, and will be succeeded by **G. S. Lytle,** assistant superintendent in the Saskatchewan district with headquarters at Wilkie, Sask.

The Canadian National announces the following changes in the western and central regions: **W. R. Devenish,** general superintendent at North Bay, Ont., has been transferred as general superintendent at Edmonton to succeed **W. A. Brown,** retired; **W. T. Moodie,** superintendent at Port Arthur, Ont., will succeed Mr. Devenish as general superintendent at North Bay; **Norman P. North,** superintendent at Hornepayne, Ont., has been transferred to Port Arthur to succeed Mr. Moodie. **Robert King,** superintendent at Calgary has been transferred to Dauphin and **J. P. Johnson,** superintendent at Dauphin, has been transferred to Calgary. **J. E. Nelson,** superintendent at Edmonton, has been transferred to the central region and will be succeeded by **J. L. Cameron,** now assistant superintendent.

E. B. Sloan has been appointed assistant to the president of the Southern Pacific of Mexico in addition to his duties as chief engineer. His headquarters are at Guadalajara, Jalisco.

T. M. Hayes, assistant secretary of the Toledo & Western, has been appointed assistant to the president of the Wabash, with headquarters at St. Louis.

J. W. Evens, special representative of the vice president and general manager of the Katy, with headquarters at Dallas, has retired. Mr. Evens has been in railroad work for 53 years.

Financial and Legal

G. F. Gerlach has been appointed assistant treasurer of the Chicago River

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& Indiana, with headquarters at the Union Stock Yards, Chicago.

Fred W. Sparling, auditor of disbursements of the Michigan Central, with headquarters at Detroit, has resigned and will be succeeded by **Theodore J. Pausch,** assistant. **Edwin A. Hancock** will succeed Mr. Pausch as assistant auditor of disbursements.

F. C. Keith, assistant auditor of expenditures of the Burlington, has been promoted to assistant auditor of miscellaneous accounts. **W. S. Pringle** has been named to succeed Mr. Keith.

George A. Dupuy, special attorney of the Illinois Central, with headquarters at Chicago, has retired. **J. Carter Fort,** commerce attorney with headquarters at Chicago, has been appointed assistant to the general counsel with headquarters at the same point. **J. T. Quisenberry** will succeed Mr. Fort as commerce attorney at Chicago. **J. H. Wright** has been appointed assistant to the general solicitor.

M. F. Stokes has been elected assistant secretary of the Belt Railway of Chicago and the Chicago & Western Indiana with headquarters at Chicago in addition to his duties as chief clerk to President Lee. **A. R. Barton,** assistant auditor and assistant secretary, will continue as assistant auditor.

Purchases and Stores

H. L. Cunningham has been appointed purchasing agent of the Midland Valley and the Kansas, Oklahoma & Gulf, with headquarters at Muskogee.

B. D. Noetzel, assistant purchasing agent of the Copper Range, with headquarters at Houghton, Mich., has been appointed purchasing agent with headquarters at the same point, to succeed **J. M. Wagner,** promoted.

H. Weindel, division storekeeper, central division, Union Pacific, with headquarters at St. Joseph, Mo., has been promoted to stores inspector with headquarters at Omaha. He will be succeeded at St. Joseph by **C. W. Craig,** now assistant division storekeeper at Green River, Wyo. **E. F. McFadden,** storekeeper at Green River, will succeed Mr. Craig as assistant division storekeeper at that point.

J. Herbert James, secretary and chief clerk to the vice president of the Pittsburgh & Lake Erie, with headquarters at Pittsburgh has been appointed purchasing agent with headquarters at the same point.

J. E. McMahon, general storekeeper of the Chicago, St. Paul, Minneapolis & Omaha at St. Paul, has been appointed assistant purchasing agent also.

Traffic

C. F. Koehn has been appointed division freight and passenger agent of the Chicago Great Western with headquarters at Fort Dodge, vice **W. C. Hine,** assigned to other duties.

The Western Pacific announces: **T. H. McMenamin, W. A. Gorman** and **Euzeb Brault** have been appointed city freight and passenger agents; **H. A. Landstrom** and **M. J. Ivers** have been appointed traveling freight and passenger agents and **J. C. Nolan** has been appointed city passenger agent. Headquarters for these appointments are at Chicago. **T. J. Clark** has been named commercial agent with headquarters at Milwaukee.

Thomas E. Sands.

The Lackawanna announces that **J. L. Homer,** general eastern passenger agent, has been appointed assistant general passenger agent, with headquarters at New York; and that **M. H. Murphy,** traveling passenger agent, has been appointed district passenger agent with headquarters at the same point. The titles of general eastern passenger agent and of traveling passenger agent have been abolished.

L. A. Behrle has resigned as assistant general freight agent of the Chicago & Alton.

Frank Jensen, assistant general passenger agent of the Texas & Pacific, headquarters at New Orleans, has been appointed general passenger agent with headquarters at Dallas.

The International-Great Northern announces that **J. M. Ball** and **J. E. Bailey,** assistant general freight agents at Houston, have been appointed assistant traffic manager and assistant general freight agent, respectively, with headquarters at the same point. **W. J. Schill** has been appointed assistant general freight agent at Houston.

The Canadian National has promoted **S. M. Greene,** city ticket agent at Regina, Sask., to general agent in the passenger department at Montreal.

Thomas E. Sands, freight traffic manager of the Soo Line, has been appointed to the newly created office of the general freight traffic manager. He has been with this road since 1888, when he started as a soliciting freight agent, and has served successively as traveling freight agent, chief clerk of the freight department, assistant general freight agent and general freight agent.

E. G. Clark, general freight agent of the Soo Line, has been appointed freight traffic manager to succeed Mr. Sands. **J. H. Rees,** assistant general freight agent, has been appointed general freight agent with jurisdiction over rates and rate legislation to succeed Mr. Clark.

R. N. Golden has resigned as general freight agent of the Minneapolis & St. Louis, and has been appointed general freight agent in charge of off-line solicitation. **W. A. Carlsen,** general agent, Detroit, has been appointed general agent, Chicago.

Eugene J. Dean, division freight agent of the Erie, with headquarters at Dayton, O., has been appointed industrial agent with headquarters at the Transportation Bldg., Chicago. **Willard P. Kromphardt,** general agent at Peoria, has been named division freight agent at Dayton to succeed Mr. Dean. **Edward T. Olander** has been named general agent at Peoria vice Mr. Kromphardt. **Edwin W. Keiley** has been appointed commercial agent with headquarters at Peoria.

John H. Rees, assistant general freight agent of the Minneapolis, St. Paul & Sault Ste. Marie, has been appointed general freight agent.

John M. Ball, assistant general freight agent of the Gulf Coast Lines and the International-Great Northern, with headquarters at Houston, has been promoted to assistant freight traffic manager.

H. P. Halley has been appointed traffic manager and auditor of the Rutland, Toluca & Northern, with headquarters at Toluca, Ill., to succeed **L. G. Arend.**

Daniel J. McGanney, assistant general freight agent at San Francisco of the Southern Pacific, has been appointed assistant to the freight traffic manager. **A. I. Hoskins** will succeed Mr. McGanney.

The Milwaukee has appointed **M. F. Edbrooke** assistant general freight agent, with headquarters at Chicago.

B. F. Morris, commerce agent of the Louisville & Nashville, has been appointed assistant to the freight traffic manager, with headquarters at Louisville.

C. C. McCarthy, general agent in the freight department of the Missouri Pacific, has retired.

R. N. Golden, general freight agent of

the Minneapolis & St. Louis, has resigned. **J. R. Shannon,** general passenger agent, with headquarters at Minneapolis, has been appointed also general freight agent to succeed Mr. Golden. **W. K. Adams,** division passenger agent at Minneapolis, has been appointed assistant general passenger agent.

J. P. Williams, division freight and passenger agent at Chicago on the Chicago & North Western, has been appointed assistant general freight agent, with headquarters at that point.

Stanley G. Bliss has been appointed commercial agent of the St. Louis Southwestern with headquarters at New York.

L. S. Staples, chief clerk in the freight traffic agency at Dallas of the Chicago & Eastern Illinois, has been appointed commercial agent, with headquarters in the same city. **Arthur L. Herder** and **Thomas L. Faulkner** have been appointed commercial agents at St. Louis and Tulsa, respectively.

F. B. McKay, general freight and passenger agent of the Texas Midland, with headquarters at Terrell, has been appointed assistant general freight agent of the Southern Pacific lines in Texas and Louisiana with headquarters at Dallas. **E. H. Norris** has been appointed manager of perishable freight traffic.

A. V. Ulrich has been appointed to the new position of special representative of the passenger department of the Michigan Central with headquarters at Detroit. **R. B. Holmes,** assistant general passenger agent, with headquarters at Chicago, has been transferred to Detroit, to succeed Mr. Ulrich.

Mechanical

L. B. Jones, master mechanic at Harrisburg of the Pennsylvania, has been transferred to the Columbus, Ohio, shop, vice **B. M. Swope,** transferred to superintendent of motive power, central Pennsylvania division, eastern region. **P. M. Cheesman,** master mechanic assigned to special duty in the office of general superintendent of motive power, western region, has been appointed master mechanic of the Monongahela division. **F. H. Pflagging,** assistant on engineer corps, St. Louis division, has been appointed assistant supervisor on the Long Island. **F. T. Huston,** master mechanic of the Renovo division, with headquarters at Erie, has been transferred to the Panhandle division, with headquarters at Dennison, Ohio.

N. M. Kerr, master mechanic of the Belleville division of the Canadian National, with headquarters at Belleville, Ont., has been transferred to the St. Lawrence division with headquarters at Montreal. Mr. Kerr is succeeded at Belleville by **J. Hawkins,** master mechanic of the Hornepayne division with headquarters at Hornepayne, Ont. **D. C. Elliott,** rules instructor on the Belleville division, has been promoted to master mechanic to succeed Mr. Hawkins.

E. B. DeVilbiss, superintendent of motive power on the Pennsylvania, with headquarters at Williamsport, has been transferred to the eastern region with headquarters at New York. **Eliot Sumner,** superintendent of motive power at New York, has been appointed assistant to the general superintendent of motive power of the eastern region, with headquarters at Philadelphia.

A. L. Broomall

Civil

H. R. Leonard, chief engineer of bridges and buildings of the Pennsylvania, has retired from active service.

James G. Taylor, special engineer of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has retired.

The Canadian National announces the following changes: **H. W. Fleming,** division engineer of the Hornepayne division, has been transferred to the St. Lawrence division, with headquarters at Montreal; **H. J. Black,** inspecting engineer in the office of the engineer of maintenance of way at Toronto, has been promoted to division engineer to succeed Mr. Fleming; **James Ferguson,** division engineer at Cochrane, Ont., has been transferred to London, Ont., and will be succeeded at Cochrane by **A. D. W. Cuthbert,** now assistant district engineer at Montreal; **Ernest R. Logie,** assistant engineer at Toronto, has been promoted to division engineer at Belleville, Ont.; **W. E. Mellor,** assistant engineer at Toronto, has been named division engineer at St. Thomas, Ont.; **W. A. Siegner,** assistant district engineer at Toronto, has been appointed division engineer at Stratford, Ont., and **L. I. Stone,** assistant district engineer on the Southern Ontario district at Toronto, has been appointed division engineer of the Toronto terminals division, with headquarters at Toronto.

F. Clinkscales has been appointed traveling engineer of the Southern Pacific, Texas and Louisiana lines.

The Erie announces that **H. M. Righter,** division engineer, New York district, headquarters at Jersey City, has been named engineer of maintenance of way of the western district with headquarters at Youngstown. Mr. Righter will be succeeded at Jersey City by **F. S. Wheeler,** now division engineer, eastern district, headquarters at Salamanca, N. Y. Mr. Wheeler will be succeeded as division engineer at Salamanca by **J. G. June,** now superintendent of the Marion division, headquarters at Huntington, Ind.

H. E. Smith, assistant engineer in the district engineer's office of the Canadian National at Montreal, has been made division engineer of the Portland division.

R. L. Sims, engineer maintenance of way of the Burlington at Alliance, Neb., has been transferred to the Illinois district, with headquarters at Galesburg.

The Santa Fe announces that **W. A. Kingman** has been appointed office engineer of the eastern lines, with headquarters at Topeka, to succeed **H. L. Hunter,** assigned to other duties.

D. K. Roll, general signal inspector of the Chesapeake & Ohio, with headquarters at Huntington, W. Va., has been appointed supervisor of signal construction, with headquarters at Covington, Ky.

E. H. Lee, president and chief engineer of the Belt Railway of Chicago and the Chicago & Western Indiana, has been re-elected president. **F. E. Morrow,** assistant chief engineer, will succeed Mr. Lee as chief engineer with headquarters at Chicago.

Obituary

A. L. Broomall, manager of the renewal parts engineering department of the Westinghouse Elec. & Mfg. Co., died April 10, at his home in Wilkinsburg, Pa., at the age of 44. He had been with this company since graduating from the Lehigh University in 1906.

Henry J. Cambie, pioneer railway builder, died at Vancouver, B. C., April 23, at the age of 91.

Judge R. M. Barton, formerly chairman of the Railroad Labor Board, died April 5 at Tampa.

Alma Katz, one of the pioneer railroad builders of the West, died at his home in Salt Lake City, April 16, aged 79. Mr. Katz was associated with Nelson Bennett in the construction of the Northern Pacific tunnel through the Cascade Mountains in Washington and the Twin Falls tunnel in Idaho. His headquarters with the Northern Pacific were at Tacoma.

William P. Ballard, general industrial agent of the Southern Pacific, died April 8 at Long Beach. He had been with this company 23 years.

Alfred Stevens, special inspector of the telegraph department, Baltimore & Ohio, died March 28.

Henry H. Wilson, assistant to the mechanical superintendent of the Boston & Maine, with headquarters at Boston, died March 7 at Concord, N. H., at the age of 64.

James O. Phillippi, formerly assistant general freight agent of the Missouri Pacific, with headquarters at Omaha, died April 3 at San Diego, aged 83.

Howel Jones, land commissioner of the Santa Fe Pacific Railroad Co., died at his home in Topeka, April 7, aged 84.

John P. Burrus, superintendent of the Houston Belt & Terminal, with headquarters at Houston, died at Kerrville, Tex., April 6.

Alexander D. Lunt, manager of the patent department of the General Electric Co., died April 25, at New York.

James J. Wood, consulting engineer of the Fort Wayne Works of the General Electric Co., and one of the pioneers of electric lighting by arc lamps in America, died April 19 at Asheville, N. C., aged 71.

Supply Trade Notes

Ward A. Miller, formerly New York sales manager in charge of the New York, New England and Canada district of **Midvale Co.**, Philadelphia, has been appointed vice president of the **Vanadium Corpn. of America. N. Petinot**, general manager of sales, has been appointed assistant to the president; **J. A. Miller, Jr.**, assistant general manager of sales, has been named general manager of sales. **Gustav Laub**, assistant secretary, has been appointed assistant general manager of sales, and **P. J. Gibbons**, assistant treasurer, will assume the additional duties of assistant secretary. **Jerome Strauss**, formerly material engineer of the U. S. naval gun factory at Washington, has been engaged for special work in engineering and metallurgical lines.

The **United States Steel Corpn.** announces the following promotions: **Harold L. Hughes** has been appointed assistant to the president; **William A. Forbes**, who has been in charge of the sale of coke by-products, has been appointed assistant to the president; **Eugene Peeples Thomas**, president of the United States Steel Products Co., has been appointed a vice president, and **I. Lamont Hughes**, vice president of the Carnegie Steel Co. in charge of operations and appropriations of the western district, has been appointed vice president at New York.

The **Clark Car Co.**, Pittsburgh, announces the removal of its general offices from the Oliver Building to 1310 Clark Building.

A. L. Van Horn has resigned as assistant superintendent in charge of postal car construction, Railway Mail Service, to represent the **Wood Conversion Co.**, with headquarters at Washington, D. C.

O. B. Capps, Inc., specializing in car equipment and locomotive sales, has been formed recently with offices at 420 Lexington Ave., New York. **O. B. Capps**, formerly eastern sales manager of the Locomotive Stoker Co., is president.

F. A. Ernst has been appointed assistant district sales manager of the **Inland Steel Co.** with headquarters at St. Louis. Mr. Ernst formerly represented the American Rolling Mill Co. at Chicago.

The **American Chain Co., Inc.**, Bridgeport, has bought the business and trade name of the **Wright Mfg. Co.**, Lisbon, Ohio. There will be no change in policies or sales organization.

The **Franklin Railway Supply Co., Inc.**, announces that **R. F. DeMott**, in the service department, western territory, has been appointed district manager with headquarters at St. Paul. Mr. DeMott has been in railway work since 1903.

The **Baldwin Locomotive Works** has received an order from the Post Office department of the government for 275 bullet-proof cabs which are to be mounted on automobiles used for mail collection and delivery.

A charter has been granted the **Canadian Ohmer Ltd.** to acquire the business of **Canadian Taximeters Ltd.** and to market in Canada products manufactured by the **Ohmer Fare Register Co.**, Dayton, O. Headquarters has been opened at 3510-12 St. Lawrence Blvd., Montreal. These officers have been chosen: **W. P. Kearney**, Montreal, president; **H. B. Ohmer**, Dayton, vice president and treasurer; **M. W. Drayton**, Montreal, second vice president and secretary; **R. M. Ohmer**, assistant treasurer. These officers, with **R. L. Hubler**, constitute the board of directors. **A. J. Hopkins** has been appointed general manager.

A. Allan & Son, Harrison, N. J., manufacturers of the Allan Red Metal King type packing ring, announce that the **Transportation Equipment Corpn.**, Graybar Bldg., New York, has been appointed railroad sales representative.

H. F. Wardwell has been elected president of the new **W. & B. Co.**, organized to manufacture an electric alloy rolling side bearing for freight cars. **W. A. Spuehler** has been elected vice president and **C. Bladin**, sales manager.

Joseph V. Santry, who has resigned as president of the **Combustion Engineering Corpn.**, New York, will be succeeded by **H. D. Savage**, vice president. **George T. Ladd**, president of the Ladd Water Tube Boiler Co., has been elected vice chairman of the board of directors.

M. J. McDonough, vice president of the **Illinois Car & Mfg. Co.**, has been elected president of the **Hammond Bolt & Nut Co., Chicago**, which was organized to manufacture the line of bolts and nuts formerly manufactured by the Illinois Car & Mfg. Co. **E. M. Joyce**, assistant to the superintendent of the Illinois Car Co., has been elected vice president of the new company. **Charles Aaron**, secretary, and **M. L. Hunt**, treasurer and purchasing agent of the old company, will hold the same positions with the Hammond Bolt & Nut Co.

The **Whiting Corpn.**, Harvey, Ill., announces that **F. P. Walsh** has been appointed manager of the crane department and **R. H. Moore**, manager of the foundry equipment department.

W. W. Glosser, vice president and general sales manager of the **Verona Tool Works**, Pittsburgh, has resigned to take charge of the New York office of **Hubbard & Co.**, Pittsburgh.

The **Watson-Stillman Co.** announces that **H. J. Hair**, formerly railroad sales engineer of the **Whiting Corpn.**, has been appointed manager of railroad sales with headquarters in New York.

H. T. Gilbert, vice president of the **Sharon Steel Hoop Co.**, has been elected vice president in charge of sales of the **Republic** and **Trumbull Steel** companies, recently merged.

Thomas J. Bray, president of the **Republic Iron and Steel Co.**, has resigned. He is 61 years old and has retired from active business.

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M24

Ball Bearing Engines
QB · PHB · PHA · QHB

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NEW YORK CHICAGO

ALIFORNIA

Transportation

The Monthly Magazine of the Transportation Industry

CALIFORNIA STATE LIBRARY

Vol. II June, 1928 No. 6

Fairmont
Mudge

An Announcement

Two names—long famous for devotion to high ideals of quality and service—are now combined.

Fairmont Railway Motors, Inc., Fairmont, Minnesota, and Mudge & Company, Chicago, Ill., have brought together their resources and facilities and will operate under the one name—

Fairmont Railway Motors, Inc.

Combined facilities, with manufacturing plants located at Fairmont and Chicago, will assure our customers a most superior type of motor car service.

We appreciate the confidence of our many friends and pledge ourselves to justify and strengthen this confidence.

Performance on the Job Counts

Here's the
Weakest Point
Of the Ordinary Hanger—

It's The Strongest Point of the Schaefer Loop Hanger

IN the ordinary brake beam hanger, the bend is a weak point—a point of potential failure.

Note how this ordinarily weak point has been strengthened in the Schaefer Loop Hanger (and all types of Schaefer Hangers). Observe that the beam effect in the cross member is carried into and around the bend, providing additional strength where it is most needed.

For even greater strength and dependability, all Schaefer Brake Hangers are heat treated and oil quenched. Schaefer Brake Hangers are built for the life of the car.

Write for illustrated bulletin and complete data.

A TRIUMPH OF DESIGN

Test of Manganese Steel Crossing Intersections

AMSCO PROCESS TUBULAR INTERSECTION [B]

vs.

ORDINARY INTERSECTION [A]

Ordinary Intersection [A]

2¼ inch metal under the flangeways.
4¼ inch metal under the tread.
Weight of casting 464 lbs.

Tons Pressure	Time	With Pressure on Deflection	With Pressure Off Set
100	5 Minutes	1/4 inch	None
150	5 Minutes	¼ inch	1/16 inch
200	5 Minutes	5/16 inch	3/16 inch
250	5 Minutes	½ inch	⅜ inch
300	5 Minutes		7/8 inch
350	1 Minute	Badly broken in the intersection	

AMSCO Intersection [B]

1 inch metal under the flangeways.
1⅜ inch metal under the tread.
Weight of casing 528 lbs.

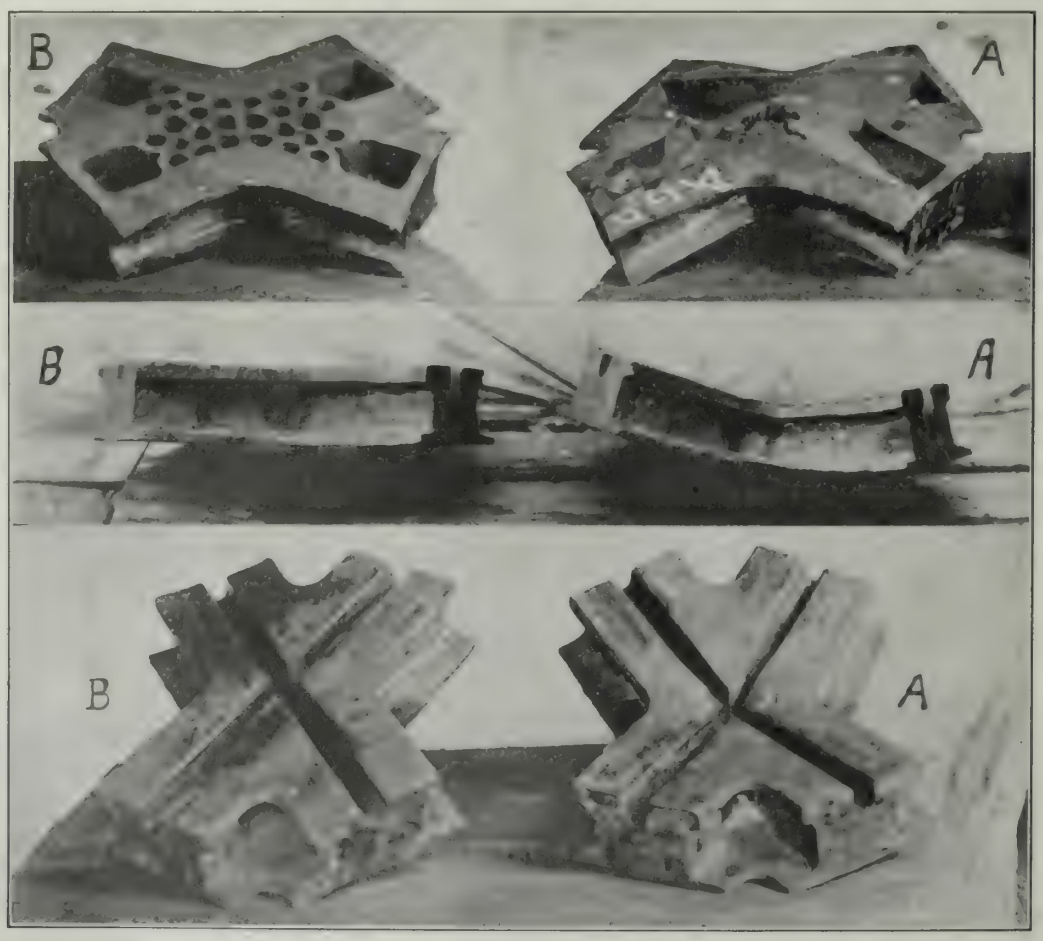
Tons Pressure	Time	With Pressure on Deflection	With Pressure Off Set
100	5 Minutes	⅛ inch	None
150	5 Minutes	1/8 inch	1/32 inch
200	5 Minutes	1/8 inch	1/32 inch
250	5 Minutes	1/8 inch	1/32 inch
300	5 Minutes	3/16 inch	3/32 inch
350	1 Minute	1/4 inch	⅛ inch

One rib underneath the intersection showed slight crack

They last longer

They ride easier

They cost less to maintain



The tubular construction provides uniform metal and prevents cracking at intersections

Buy the Tubular Bottom AMSCO when replacing your next Manganese Crossings.

LOUISVILLE FROG AND SWITCH CO.

LOUISVILLE, KENTUCKY

SKF
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Bearing Capacity *affects* Bearing Life

NOT
for a few months
FOR 12 YEARS
Not on a few journals
ON 25,000 JOURNALS
Not on a single Railroad
ON 39 RAILROADS
in
THIS COUNTRY
and
on the railroads
of
21 COUNTRIES
ABROAD

THE value of anti-friction journal bearings to a railroad is determined by their length of life.

Anti-friction bearings will always cost more than plain bearings. To be worth more they must develop many times the life and be entirely dependable during that period.

This demands a high bearing capacity which, in turn, requires more space than is provided by standard A. R. A. designs.

It is entirely possible to fit anti-friction bearings to existing trucks—bearings that will run for long periods without showing the usual conspicuous hot boxes that develop from overloaded plain bearings.

But it is impossible for such a bearing, overloaded as it must be, to last the million miles that are necessary to justify its use.

SKF Journal Bearings are built to provide the necessary bearing capacity rather than to compromise with existing design.

SKF INDUSTRIES
INCORPORATED
40 East 34th Street,
New York, N. Y.

2028

JOURNAL SKF BEARINGS

The Best Grip Nut Advertisement

THE *best* Grip Nut advertisement is a Grip-Nut-equipped railroad.

When a road standardizes on Grip Nuts, nut replacements are fewer; annual nut consumption is smaller; maintenance costs are lower. "Bad Orders" at a minimum; more locomotive- and car-miles; equipment in service for longer periods.

"After 148,000 miles of service," writes one official, "Locomotive No.——, equipped with Grip Unit and Grip Locomotive Nuts, had every nut holding tightly." Evidence that Grip Nuts do exactly what they're built to do—they hold, under every service strain.

Apply Grip Nuts; they make the best railroads better.

GRIP NUT COMPANY

5917 South Western Avenue

CHICAGO, ILLINOIS

Transportation

The Monthly Magazine of the Transportation Industry

JUNE, 1928

VOLUME TWO NUMBER SIX

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LITTLE STORIES OF BIG MEN

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Electric
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designed and built by us throughout at

Oak Island Terminal,
Newark, New Jersey
1928

Pictures tell the story

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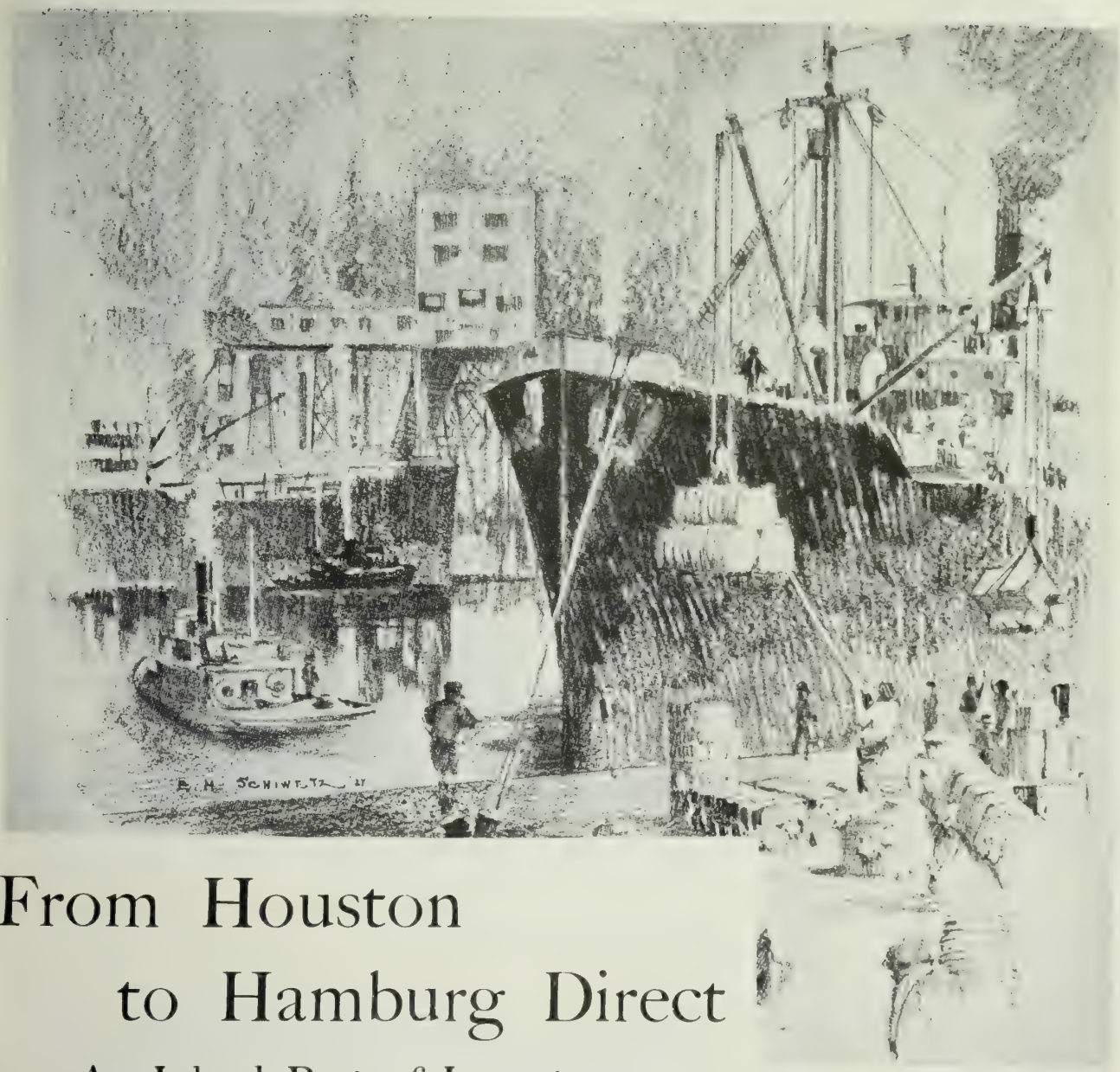


From Houston to Hamburg Direct

An Inland Port of Importance

By Charles Dillon

THE MAN who lives in a boastful city where everything is the largest, the finest or the first is likely to be astonished somewhat when he travels far from home. One feels that way about Houston and its remarkable development in recent years, increases and improvements not likely to be seen unless one stays a day or two or a week. To rush from train to taxi cab, into a club room for a 30-minute talk, out again to the railroad station and away for the West is no way to see a city like Houston. Of course a citizen of Dallas, a commercial rival, will declare that 30 minutes is altogether too much time to spend in Houston, but the experienced American recognizes and allows for the spirit of competition. He has seen it working in Seattle and Tacoma; Minneapolis and St. Paul; Chicago and New York; Los Angeles and San Francisco, friendly enemies in the engrossing business of building great cities.

Still, one is bound to wonder just what there can be in and about this Texas city of 300,000 population to warrant the existence of 18 railroads, steam or electric. The wonder grows, too, when it is learned that 3,560 seagoing vessels arrived and departed from the port of Houston in the calendar year 1927. In 1922 there were 1,006 such vessels in and out. It is growing.

You may not have expected this kind of information, but it does convince you that railroads are certain to profit from such water activities. Vessels do bring in freight as well as take it out. Also they carry passengers, which is relevant here for the fact that ocean-going liners are now landing their pas-

Houston, An Inland Port of Growing Importance, Has 300,000 Population, and Many Skyscrapers.

sengers at Houston piers direct from Hamburg and other European ports.

A bit thick isn't it? Houston, you have always heard, is fifty miles or more from the sea. Well, nevertheless, there are passenger liners and great freight carriers coming in there every day, loading and unloading, steaming through a ship channel 250 to 300 feet wide having a uniform depth of 30 feet. This channel extends from the Gulf of Mexico through the jetties between Galveston Island and Bolivar Peninsula across Galveston Bay, 25 miles, thence up the San Jacinto River through low lying marshes and shallow bays to Lynchburg a distance of nine miles, then up the historic Buffalo Bayou passing the famous San Jacinto Battleground to the Turning Basin at Houston, a further distance of 16 miles, making a total of 50 miles from the harbor to the gulf. From Galveston Bay to the Turning Basin the natural channel has been deepened, widened and straightened, and the banks from 8 to 30 feet in height offer excellent locations for industrial development with rail and water connection. The Turning Basin is 30 feet deep, and has a diameter of 1100 feet.

As soon as Houston was assured of becoming a deep water port, private capital began to take an active interest in its development and to secure suitable locations along the channel for industries where proper water and rail connection could be provided at least expense. These industries have now a capital investment of about $125,000,000, and employ about 12,800 men with a daily payroll of approximately $79,000. New industries are establishing plants on the waterway every year, and the existing ones are making substantial additions from time to time. These private plants now have 11,575 lineal feet of wharves, sufficient to berth 32 vessels. North of the Turning Basin is the large classification yard capable of holding 4,000 cars which is the clearing house of the Public Belt Railroad and the various lines serving Houston. From this classification yard several lead tracks reach the water front to serve both sides of the channel as well as the new terminals.

A direct lead from the classification yard serves the wharf and shed tracks so that the only traffic using these tracks is wharf business to and from the large classification yard. Springing from another part of the classification yard by another separate and distinct set of leads are the tracks serving the warehouse area, the grain elevator and the Public Belt main line. From this it will be seen that no grain, warehouse, or main line traffic comes anywhere near the tracks serving the wharves themselves. This probably would not be of any consequence unless the terminal were fairly crowded, but at the times of movement of grain for export, there is a tendency to flood or congest port facilities, and in the arrangement as mentioned there can be no confliction, such as exist in many ports and the terminal can run full speed both in the export of grain and cotton and with its other miscellaneous business, without any additional switching or delay which many times is accordingly unavoidable.

On July 1, 1924, there was put

Near the Head of the Ship Channel; Railroad Yards At Left Center, and Turning Basin Near the Top.

in operation the Port Terminal Railroad Association which operates all the facilities of the Public Belt Railroad, connecting with the main trunk lines entering the city and providing for a neutral switching organization to handle all traffic to and from the port terminals and industries with equal dispatch and without discrimination to all of the 18 railroads reaching the city. This arrangement is proving a very satisfactory solution of the railroad and port terminal problem and with the extension of the Public Belt Railroad and this service along each side of the channel every industry is guaranteed the maximum of rail and water service.

Turning Basin At the Head of the Houston Ship Channel, Used by the Largest Ocean Liners.

The business of the Port Terminal Railroad Association showed an increase in 1927 over business of the previous year, there being 127,238 loaded cars moved during the year as against 109,369 loaded cars moved during 1926, these figures including not only loaded cars delivered to connecting railroads, but also loaded cars moving between points on the Public Belt Railroad trackage.

The use of the Houston Ship Channel as a waterway dates back to the early settlement of Texas, sail boats working their way up the meandering tidewater stream of Buffalo Bayou as early as 1825. This was followed later in the '60s and '70s by steamboat traffic when a line was established by Commodore Charles Morgan between Houston and New York using shallow draft sidewheel steamers. This type of vessel soon became obsolete, and as the condition of the stream would not permit the entry of deep draft ships, the traffic was limited to tugs and barges. Houston being a great concentration point for cotton a large fleet of barges was kept busy conveying the cotton from the compresses and warehouses to shipside in Bolivar Roads and Galveston.

By the River and Harbor Act of March 3, 1899, a project for the construction of the Houston Ship Channel to a depth of 25 feet was adopted. Progress was rather slow and it was not until 1910 when the local interests proposed to share with the government half of the cost of the construction and completion of this 25-foot channel that serious and determined efforts were made to complete it promptly. Congress then appropriated $1,250,000 and the navigation district comprising Harris County issued bonds to the same amount and contracts were let for the entire project. This 25 foot channel was completed to full depth and width on September 7, 1914.

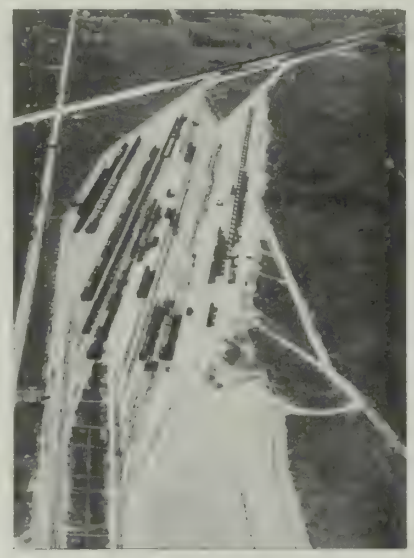
This channel proved inadequate for the traffic developed and congress approved the project on March 2, 1919 for deepening the entire channel to 30 feet and widening it to 250 feet across the bay and 150 feet from Morgans Point to the Turning Basin. The local interests were asked to contribute $1,365,000 toward the cost of the work, which was estimated at about $4,000,000. The 30 foot channel was completed in September, 1925. And now hearings are going on looking to still further

The Morgan, Southern Pacific Docks on the Houston Ship Channel. Steamships from Everywhere End Their Voyages Here.

developments, the channel to be made still deeper and wider and otherwise improved.

A party of railway officials including President Ralph Budd of the Great Northern Ry., and others went over the whole channel project one day last month, deeply interested in the very wonderful development in recent years, and in the amount of traffic the channel provides for railroads, much of it from European ports. But in addition to the purely water-originated volume of business these railroad men wondered over the port statistics which seem to indicate that Houston is giving Galveston an interesting contest for supremacy as an ocean port. The records of the port authorities show that in 1927 Port Houston received shipments from Holland, Italy, Mexico, Norway, Spain, the United Kingdom, the Argentine, Belgium, Brazil, China, Japan, Cuba, France, Germany, Russia, and many other countries; and all these shipments continued their travels over some of the railroads serving the port.

Already Houston is becoming a port city of superlatives so numerous that a visitor from the Pacific Coast feels quite at home. For instance one is assured that in cotton, rice and lumber, Houston is preeminent, ranking as the largest spot market, the largest inland cotton port, and second largest export cotton shipping center in the world. Warehouses, compresses, cotton oil and cotton seed companies have enormous interests there. Railroad men say Houston is the second largest primary rice market in the South with four mills producing a million bags of milled rice every year. It is, perhaps—and the qualifying word is spoken almost inaudibly—the largest lumber city in America with 49 yellow pine manufacturers and representatives in the city for 250 sawmills of Texas, Louisiana and Arkansas.



Yards of the Port Terminal Railroad Association.

When cotton is mentioned the Houston enthusiast simply doesn't argue. Words fail. He points to the figures showing that in 1927 the port handled for export 2,158,475 bales. Then he shows you the export figures for 1920 when only 275,000 bales went through.

Eighteen railroads serving the city and port; 70 steamship lines using its port facilities in a year; more than 3,500 ocean-going vessels in and out; more than two million bales of cotton—they tell you the tale so convincingly down there that the well-known and much-liked southern drawl seems out of place.

"Houston," you venture to say, "Houston seems to be growing."

" 'Seems to be'," the southerner exclaims, "Why, suh, in 1927 we expo'ted mo———."

But all his facts are in the story.

A Passenger Liner From Europe Is Being Eased Into Her Berth At One of the Great Docks on the Ship Channel At Port Houston.

The Romance of Vanadium Steel

How Joseph Flannery Won

Loading Vanadium Ore on Steamer From Barges At Callao.

By Walter Mann

IT ISN'T the man that counts so much as the thing the man has done. True, we all want credit for the work we do. Sometimes we get it, but history has such a perfectly discouraging way of mixing names and places in the rush of a busy world that very often the flowers come too late or they go to the wrong address.

It happened not long ago in a story cabled over from Paris about a scientific old chap named Helouis —Prof. Narcisse Alfred Helouis— who was declared to be the inventor of the French process of making vanadium steel. There he was, 87 years old, nearly starved, clad in rags, alone, living in a tiny room in a wretched tenement in the lowliest part of gay Paris. You couldn't ask for a more interesting setting for a romance. The record shows that for fifty years Professor Helouis has been working at one thing or another, pretty well known to scientific men, until finally he dropped out of sight a few years ago, and was heard of no more until rescued by friendly savants.

Certainly one may be pardoned for using the word romance in the story of vanadium. Here we have a drama in five acts, the proper length for an evening's entertainment as all gray-heads know, with scenes in old Mexico, a hundred years ago, Sweden, France, the United States and Peru, with high ambitions thwarted, hopes deferred, long journeys over land and sea, and then success! We have a strong lead in the caste, too, Mr. Joseph Flannery of Pittsburgh. What more do you ask for your romance?

Quite naturally, when you read the story of a man keenly interested in rare metals you think of one trained in science or, perhaps, in a machine shop, a mechanic out of the ordinary. But Joseph Flannery had no such origin. His honorable ancestors, his father and his father's father, were undertakers, and that grim trade had been selected for Joseph. In several Allegheny County towns around Pittsburgh the Flannery undertaking "parlors" were favorably known, and as popular as such re-

Vanadium Mines of Mina Ragra.

sorts usually are with the general run of human beings. Indeed a Flannery funeral in Pittsburgh was about the best thing a man could look forward to as the finish of his earthly career.

But undertaking made no hit with Joseph. When his watchful father saw that family traditions were about to be shattered and that anything he might say would have no influence in preventing it he did what many a father ought to do: expressed his readiness to contribute mature counsel whenever Joseph might need it, and then let him go out and build his own life.

Joseph was about 35 at that time. Among his acquaintances in those days was a metallurgist, Thompson by name, whose entire time seemed to be taken up with talk of vanadium. Indeed a good many persons of influence in Pittsburgh were acting the same way just then, and many who talked and thought about it didn't know whether vanadium was a new game or a breakfast food. The most of the world was ignorant of its rare qualities. The word had an attractive sound which caused some to ponder over its origin, a matter to be taken up in the last reel if we don't forget it.

To get men interested in a metal so important in the making of steel as vanadium had proved to be in France and Sweden was not difficult, but to find some one willing to travel to Peru, where large deposits were reported, was something else again, for Peru was and still is a Far Country. Eventually, however, two men were found—Joseph Flannery and Thompson, the metallurgist. There seems to be a lot of material at this point for space writing, but perhaps the less we use of it the better off we shall be. The journey was what vaudeville persons call a flop. The vanadium was there, all right enough, and so far as Senor Fernandini was concerned it could stay there until further orders.

It was a waste of time to talk money to this Peruvian grandee. He was wealthy. Benefiting struggling humanity didn't appeal to him either. The picture of a world standing around with its tongue hanging out, longing for vanadium, a word picture painted by the skilful Flannery, might have won fame and applause up north but it left Fernandini cold in Peru.

So Flannery went home. He went home and he talked and planned; he talked vanadium until folks used to cross the street to get away from him if they saw him first. All big men with big ideas have lived through his experience. And so did Flannery. But he stayed cheerful and after a while went back to Peru. The record isn't quite clear as to who went with him, but someone did; some Pittsburgh comrade whose interest in vanadium was just as keen as Joseph's but not quite so inexhaustible; someone who lacked the sticktoitiveness of Flannery. This fact developed as conference after conference ended in failure, the Peruvian as unmoved as the metal he owned in the fabled Andes Mountains. "I'm going home," said Flannery's partner. "I'm not going to spend my bright young life down here talking into a void. It's a senseless proceeding."

Motor Trucks on Rails Were Found More Economical Than Steam in Handling the Sacked Ore.

"Just one more crack at him," said the hopeful Flannery. "I have an idea."

"Yeh?" exclaimed the tired comrade. "Well, you'll need much more than ideas to stir the fretful Fernandini."

Flannery's idea was interesting. It seemed to rise from his study of psychology. He had a letter of credit for $20,000 and this he had turned into gold—twenty dollar gold pieces. "Well of all crazy things," said his partner.

"Just what's the purpose of the suit case?" the comrade inquired, a bit loftily, when Flannery appeared the next day at the appointed hour with the new piece of luggage carried by a porter.

"Never mind," he replied. "Let's go. There'll be plenty of talk with the Don. Never mind about the suit case."

Fernandini was delighted to see the visitors. In a way his life had been made much more interesting by these talks with the men from the North. But, he assured them, pleasantly, he didn't wish to give up his holdings, he didn't wish to be turned out.

"That's just the point," said Flannery. "We don't want to turn you out, and we've been trying to tell you so for weeks. We want you to stay in; we want you for vice president in charge here. We are offering you $200,000 for a part of your holdings, and here is our first payment."

With the words Flannery lifted the suit case to the table before which the three men sat, and to the astonishment of two of them dumped out twenty thousand dollars in gold!

Fernandini was wealthy, as wealth was viewed in Peru, but nevertheless twenty thousand dollars in twenty dollar gold pieces was a pretty sight to see. Moreover, it was a visible and convincing proof of the Americans' sincerity. Gold has this effect in most cases. It is much pleasanter in the hands than promissory notes or currency. It's an agreeable thing to have. Fernandini liked it as he liked the idea of a vice

Joseph Flannery, the Indomitable.

presidency in a big company. So he signed the papers, all carefully prepared in advance by the thoughtful Flannery, and the conference adjourned subject to call.

There was much to do when the party reached home. Something had to be done to make men understand vanadium, something startling. You can't get far in a busy world talking of scientific properties in terms few understand. Pocket knives and razors of steel containing the mysterious hardening alloy were made, but they didn't stir up much excitement. Something more had to be done; something spectacular.

So Flannery had an idea. He made some saws. Then one day he rented the gold room in the Waldorf-Astoria in New York, arranged an imposing display of various machinery which may or may not have been anything more than scenery, and numbers of impressive timbers, among them some cross ties. Then he invited editors and reporters from the newspapers and scientific journals of the day, not forgetting numerous industrial leaders. When the great day came and the crowd was there, some of it supercilious and some of it filled with doubt, the persistent Flannery proceeded to drive large husky spikes into some

Parlor, Bedroom and Kitchen; No Bath. Indians Who Work in Vanadium Mines at Mina Ragra.

The Mina Ragra Railway. The Little Locomotives Were Replaced With Motor Trucks.

of the timbers and ties. Then a number of saws of well known make were shown the spectators.

"These saw," said Flannery, "are the world's best. You all know their names even if you haven't used them."

A reporter was invited to saw a tie in two, and much to the amusement of the crowd eventually did it.

"Now," said the vanadium showman, "I want you to saw through this tie containing the spikes."

Of course the best saws in the world crumpled up when they struck the spikes.

"And now, gentlemen," said Flannery, "we shall try a saw made of vanadium steel."

You couldn't ask a more convincing demonstration. The new saw cut through the spikes as it cut through the wood, and the party broke up applauding, the editors and reporters hastening away to tell the waiting world of a wonderful alloy that did amazing things, and the industrial leaders to marvel over a new member of the metal family certain to effect a change in the making of steel.

It created a sensation. Still no automobile man could be induced to take vanadium, not even the biggest of them, and no railroad man wanted anything to do with it. The world's progress in such things has been achieved despite such stubbornness. Finally the determined Flannery went to Henry Ford and asked him to make fifty cars with vanadium steel. Ford wouldn't make fewer than a hundred, but he did make that many and, as history shows, was the first manufacturer to put the strange alloy to its proper use where it was needed.

Flannery had another acquaintance with a lot of good sense in his make up, A. P. Prendergast, then superintendent of motive power on the Baltimore & Ohio, now in the same position on the Texas & Pacific, and through his help brought vanadium sharply to the attention of railroads. You can't get Prendergast to tell you a thing about this, but the record shows nevertheless that vanadium was used on a Baltimore & Ohio locomotive without the knowledge of any higher official, and it is just possible that this fact may not yet be known to the heads of that company. Now all the railroads use it.

Twenty years ago or thereabouts vanadium was worth something more than $4,792 a pound which is about twenty times the value of gold. The Peruvian deposits in the Andes caused a drop to five dollars, and you can buy it today in Pittsburgh for about one-half that price, and Pittsburgh seems to own or control about all there is of it in the known world. It made men wealthy. Flannery, as might properly be expected, prospered, but not nearly as much as others, and not one-quarter as liberally as his hard work and intelligent exploitation deserved.

The wonderful expansion of the steel industry in the United States during the last fifteen or twenty years from about 25 million tons to 45 million has been due very largely to the requirements of transportation. Particularly is this

(Continued on Page 78)

Modern Dwellings of the Workmen Now Employed in the Vanadium Mines.

Air and Rail Service Soon to Begin

New York to Los Angeles, 48 Hours

By W. J. Kennedy

—Herbert Photo.

With Air and Rail Passenger Service, This Summer, the Trip From New York to Los Angeles Will Be Made in 48 Hours.

THE Cleveland Southwestern Railway & Light Co., occupies about one inch in the well-known Pocket List, and its eleven or twelve motors travel over only about 230 miles of favored sections in Ohio. But it has established, and formally announced the country's first air-and-rail transportation. The new service began May 28. Here is the official proclamation issued by the company, with the exception of a good-natured dig at the two leading transcontinental lines which are to begin the same kind of service within the next few months:

"Passengers can step from our cars to the adjacent airport at Cleveland, and there board the planes for Detroit without loss of time. These close connections permit a schedule of slightly more than three hours between Ashland and Detroit, and about three hours and forty-five minutes between Mansfield and Detroit.

"Through tickets will be sold from Medina, Wooster, Ashland, Mansfield, Crestline, Galion, Bucyrus, Elyria, Oberlin and Wellington, and the local agent of the Southwestern will make seat reservations on planes for passengers."

Air-and-rail service between New York and Los Angeles reducing the present railroad running time to two days is to be established this summer, if the program of the Pennsylvania Railroad, the Santa Fe System, and a new company to be known as the Transcontinental Air Transportation, Inc., are carried to completion. Formal announcement of the plan has been made by C. M. Keys, president of the Curtiss Airplane & Motor Co., President W. W. Atterbury of the Pennsylvania Railroad, and W. B. Storey, president of the Santa Fe.

The new company to be headed by Mr. Keys has been formed to establish a network of combination rail and airplane routes by airplane, railroad and banking interests. The first service to be offered the public will permit passengers to leave New York on the Pennsylvania Railroad at 6:05 in the evening, take an airplane after breakfast in the morning at a point near Columbus, Ohio; stop for luncheon at St. Louis and continue the flight to Wichita, Kan., in the afternoon; transfer to the Atchison, Topeka & Santa Fe Railroad train at a convenient point

—Wide World Photo.

New Tri-motored Fokker of the Western Air Express, Now in Three-Hour Daily Passenger Service Between Los Angeles and San Francisco.

in New Mexico, where they will again board planes and fly the next day to Los Angeles, arriving there in the late afternoon.

Rates for the air-rail trip, while not yet definitely determined, will be approximately two and a half times the present railroad fare of $109.77 from New York to Los Angeles.

The route selected avoids all night flying and permits the use of rail transportation through country over which air flight is considered dangerous at present.

The company plans to begin operations with the most modern American aircraft equipped with every known safety device, radio communication and steward service. Tri-motored planes carrying 14 passengers each, with a scheduled flying speed of 90 miles an hour but capable of making 120 miles an hour, to permit leeway to offset prospective delays by trains, will be used in the new service.

Tickets will be sold entirely by the railroad companies. Passengers' hand baggage will be carried in the airplanes and heavy luggage will be checked to their destination on the trains.

Transcontinental Air Transport will begin business with $5,000,000 no par common stock, all of which has been subscribed and none of which will be offered for public subscription. The stock has been purchased by a powerful group headed by Blair & Co., bankers, and including interests prominently identified with the Pennsylvania Railroad, the Curtiss Airplane and Motor Co., the Wright Aeronautical Corpn. and the Ford Motor Co.

General W. W. Atterbury, president of the Pennsylvania Railroad, in referring to the new service, said in a formal statement:

"The Pennsylvania Railroad has taken this step after careful consideration. Our railroad has become part owner of the Transcontinental Air Transport, Inc., in the belief that the time is ripe for the establishing of safe and convenient passenger airplane service in this country, in coordination with rail facilities.

"Years of flying and careful research have demonstrated that, with proper maintenance and operation, passenger airplanes of the type to be used by the new com-

Cabin of the Fokker F-10 Tri-Motor, Accommodates 12 Passengers. Forward of the Cabin Is a Baggage or Radio Room. Behind the Cabin Is a Toilet and Washroom, and Back of This a Baggage Compartment.

pany, flying only in daytime and over carefully selected and marked routes, can be operated safely.

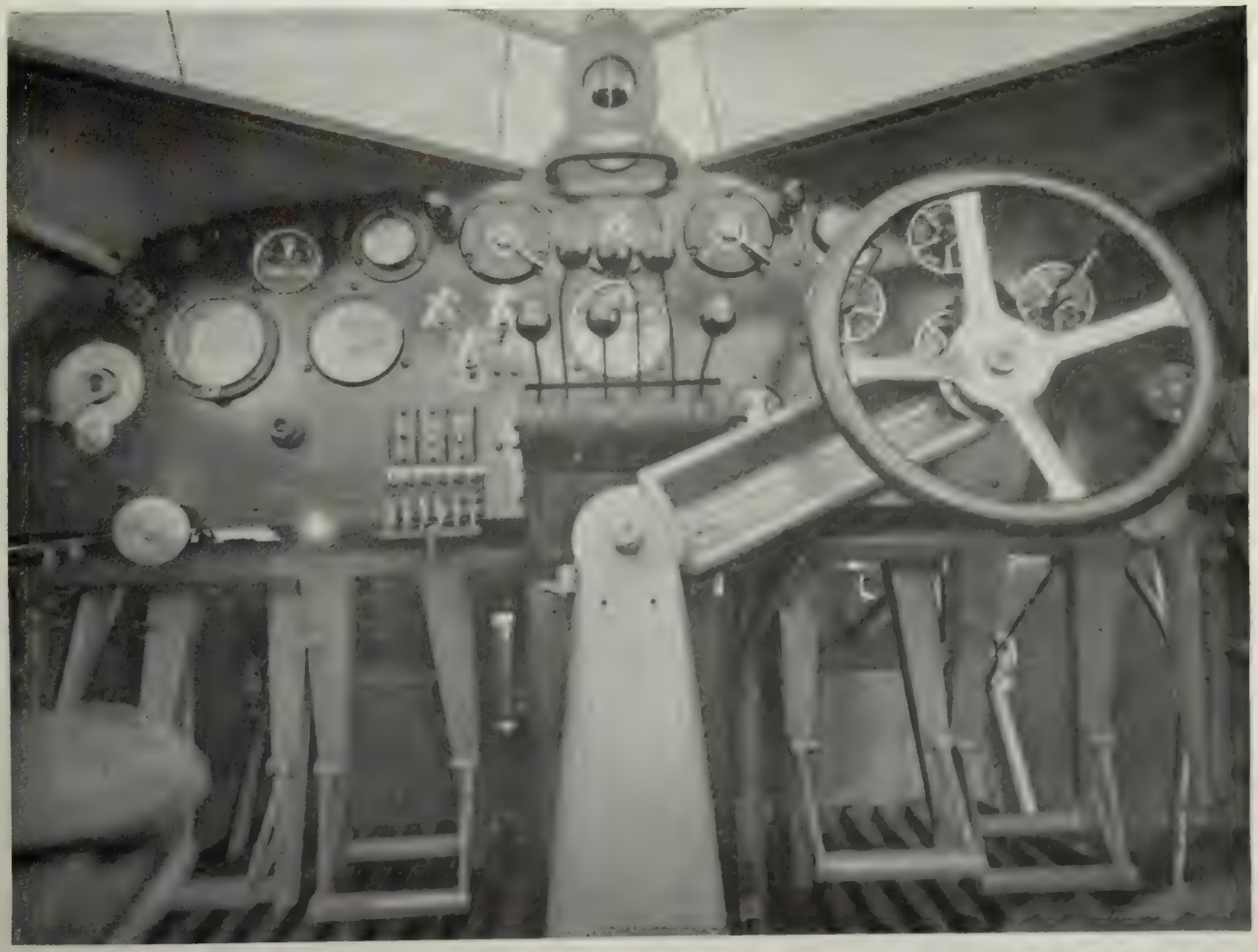
"Not until we were convinced that a dependable air service could be produced on a sound basis and that an independent organization had been developed competent to give a safe and satisfactory service did we feel justified in giving our support to such an enterprise. We feel those conditions are met in the present undertaking and that it will be the forerunner of far-reaching developments."

"There is no dearth of passenger business for air lines," said Col. Paul Henderson, president of the National Air Transport in New York. "The passenger travel on air lines has come a great deal faster than we expected and much faster than we have been able to handle it. The business of the future is most promising."

It is understood that the western half of the new air-rail system will be operated with an arrangement for part of the route with the Boeing company, which now carries mail, passengers and express on a 24-hour schedule between Chicago and San Francisco. This company is constructing several tri-motored cabin transports which will be placed in service on the western division of the air mail. It connects at Salt Lake with the Western Air Express, which flies with passengers and mail from Salt Lake to Los Angeles, and operates another express line between Los Angeles and San Francisco.

Projects are under consideration that will enable passengers from many cities to make connections with the transcontinental line. Among them is a northern air-rail system whereby passengers can fly between Detroit and St. Paul, and possibly between Buffalo and St. Paul, making the northern jump over the Rocky mountains by train and taking advantage of the New York Central's fast trains between New York city and Buffalo or Detroit. This last plan, however, is only in its earliest formative stage. It is believed when the new transcontinental air-rail line is in operation numerous other plans will suggest themselves and that combination air and rail travel will be greatly extended.

Directors of the new Transcontinental Air Transport, Inc., have been announced by C. M. Keys, the president. They are Harold Bixby, president of the St. Louis Chamber of Commerce; Howard E. Coffin, Detroit, chairman of the



Cockpit of the Fokker F-10, Tri-Motor Passenger Plane, Showing the Instrument Board and Dual Control for Pilots. Los Angeles-San Francisco Service.

—Wide World Photos.

This is the German, Junkers Flying Pullman, Tri-Motor, 16-Passenger Plane Soon to Go Into Regular Non-stop Service Between Berlin and Paris—Sleep While You Fly.

board of National Air Transport; Thomas Eastland, San Francisco; Julian L. Eysmans, vice president of the Pennsylvania Railroad in charge of traffic; Fred Harvey, Kansas City, representing hotels and restaurants along the Santa Fe route; William B. Mayo, chief engineer of the Ford Motor Co., and William H. Vanderbilt.

The directors named an executive committee from their membership. Paul Henderson, vice president of the National Air Transport, Inc., was named vice president of the Transcontinental Co.

The same day the transcontinental air-rail service was announced three-hour air passenger service began, with much public ceremony, between Los Angeles and San Francisco. Saturday morning, May 26, two of the palatial trimotored Fokker cabin planes of the Western Air Express started on their history-making flights, one from Los Angeles and the other from San Francisco. The slim-bodied, silver-winged Los Angeles plane, carrying 12 passengers and piloted by Capt. Norman Potter, veteran airman and overseas flyer, sped down the runway at Vail Field in front of the new hangars and shot into the air at exactly 10:30 a.m., and at 1:30 p.m. appeared over Mills Field in San Francisco.

Cy Morehouse, one of the crack pilots of the Western Air Express, lifted the San Francisco plane into the air at Mills Field after a run of only a few hundred feet at approximately the same moment the Los Angeles plane took off at Vail Field, and landed in Los Angeles at 1:35 p.m.

Within the next few days, it was said, the radio equipment of the air liners will be installed, tested and in operation, allowing the pilots to receive weather reports while in the air and making it possible for passengers to airgram messages.

The passengers, "enjoying Pullman car comfort," to quote the report of the epochal flight, looked out of the sliding windows on each side of the plane and watched one of the most scenic parts of California glide slowly away below them. Shortly after noon the relief pilots and radio operators of both planes passed out prepared lunches consisting of fried chicken, sandwiches, fruit and cake. They were included in the service that went with each ticket, which also included transportation to and from the airports.

Three of the trimotored de luxe Fokker 12-passenger cabin planes have been purchased by the Western Air Express to carry on the regular service between Los Angeles and San Francisco. They were built at a cost of $80,000 each and are capable of developing a speed of 150 miles an hour.

Illustrations by Courtesy of The Scientific American

Stair to "Duplex" Berths **Night View, Looking Toward Window** **Washstand Between Berths**

A New Idea in Sleeping Cars

Who, if you please, is Ernest Flagg who has been saying so many things recently about sleeping cars, and has even gone so far as to have one built as he thinks it ought to be for the comfort of human beings—who is Ernest Flagg?

Mr. Flagg is an architect and inventor living in New York, and said to be well known there. That is to say he is in business in New York, and probably lives on Long Island or over in Brooklyn. But wherever he lives Mr. Flagg has accumulated some ideas about Mr. Pullman's cars that are worth studying.

"The ordinary sleeping car," says this New Yorker, "is a relic of primitive conditions which have elsewhere been eliminated from daily life. These conditions are not found in our houses, hotels, nor even in vessels. For many years the trend has been toward greater comfort, privacy and convenience in living. In this progress sleeping cars have lagged behind. No improvements of a radical kind have been made in them since they were invented. I went to St. Paul, when a child, in 1863, and part of the journey was in sleeping cars. I remember them as well as if it were yesterday. There was straw on the floor, a stove at one end, and the lighting was from candles in smoky glass-covered boxes, but in other respects conditions were as they are today. The upper berths were hinged as at present. Improvements have all been in non-essentials; the passenger still sleeps and dresses as best he can in a bunk behind a curtain. The stumbling block to improvement has been cost. If that could be disregarded of course almost any degree of comfort and luxury might be had, but cost makes greater comfort prohibitive for the average person. The only way out of the difficulty lies in a more economical use of space, and this is precisely what the Flagg car does.

"In the ordinary car one third the cubic content is wasted for it is one third higher than necessary. There is height enough for one and a half stories, but not enough for two. Until the present time no one has hit upon a plan by which this waste space might be brought into use. The Flagg car makes it available, and 16 excellent berths are thus obtained.

"As there is a gain of one-third in utilized space, there should be a corresponding gain both in economy and comfort, but as we shall presently show, the actual gain is even more.

"The car is of the same dimensions as the standard Pullman sleeper. It has a passageway at one side for about two-thirds its length, opening from which are rooms having ceiling height of about seven feet. Each room is provided with a toilet, wash basin and a considerable recess for luggage. There is also a comfortable arm chair and a bench which can be shifted from one side of the room to the other so that the passenger may ride forward, backward, or in any other way he chooses. At night the bench forms part of the bed, the rest of which with mattresses and other bedding, is stowed during the day in a recess completely out of the way. The bed is wider than the Pullman bed and would serve comfortably for two persons. As there is only one bed the railroad could hardly demand two tickets from one passenger as at present.

"The Flagg car of standard Pullman size has 16 duplex berths all gained from space now wasted, also seven private rooms with double beds and one lower berth

Day View, Looking Toward the Door.

in the dayroom where it would be possible to have more if desired because at night all the seats would not be needed.

"The ordinary 12-section Pullman car has 13 lower berths and as many upper berths. Of the latter from 80 to 90 per cent are commonly unoccupied. Passengers take upper berths only when they cannot get lower one, and if no lower berths are to be had on one line, they buy tickets on a competing line, where competing lines exist, or travel by day. In the Flagg car there are no upper berths and the duplex berths are in most respects, far preferable to Pullman lower berths. The objection to the Pullman upper berth is not its elevation, but the difficulty of getting in and out of it. This objection does not apply to duplex berths of the Flagg car."

The Scientific American which provides the photographs of the model Flagg car built by the Canadian National Rys., says the second story is reached by a stair to a platform which forms a passage between the two upper or "duplex" berths. The up-stairs berths are not as wide as Pullman berths, but are as wide as steamship berths. Mr. Flagg's statement says,

"On either side is a berth, with space for storing baggage. Between the berths, and screened from the view of occupants of either, is a combination lavatory. Above this is a mirror and convenient light. At the end of the duplex platform is a curtain which makes for greater privacy, and prevents people passing along the public corridor from seeing into the occupied berths. Use is made of the hitherto wasted space under the roof of the car, without undue crowding or cutting too much the head-room of passengers either in the lower room or the duplex berths. The car itself will be the standard Pullman length, with the corridor along one wall near the windows. Although each room and duplex unit will have its own plumbing, there will be at one end of the car a toilet for men and at the other a toilet for women. During the day, persons in the rooms may draw the curtains and have complete privacy. At one end of the car there is a large 'day room,' or lounge, in which passengers may sit, as in an ordinary parlor-car."

The reason why so many men fail is because they will not make the sacrifices of time, of pleasure, of comfort demanded by success.

—James Couzens.

Sydney, Australia, has added 30 American buses to its municipal service.

One of the "Duplex" or Up-Stairs Beds.

Reducing Locomotive Maintenance

By W. E. Woodard

Vice Prest., Lima Locomotive Works

THE railroads' coal bill can be reduced still further by the purchase of modern power units. Much has been done toward fuel economy in the last few years, and to this association should go great credit, but the accomplishment still possible to achieve may be realized when you understand that the locomotive shown above represents less than five per cent of the freight power of the country, much of the power being unable to produce the results shown on the slide as "other locomotives."

Locomotive maintenance costs more than coal. Although this item of expense has been reduced, it is true, it has not fallen as rapidly as fuel costs. Advances almost always result from comparisons. It was the reduction in locomotive fuel consumption that called attention forcibly to the large item of operating expense: maintenance, and this, in turn, forces the conclusion, reasonable it seems to me, that the locomotive designer in planning future developments should consider changes in mechanical construction of the locomotive which promise substantial improvements in the maintenance item. And these should be undertaken and go hand in hand with any further advances directed to betterment in fuel performance.

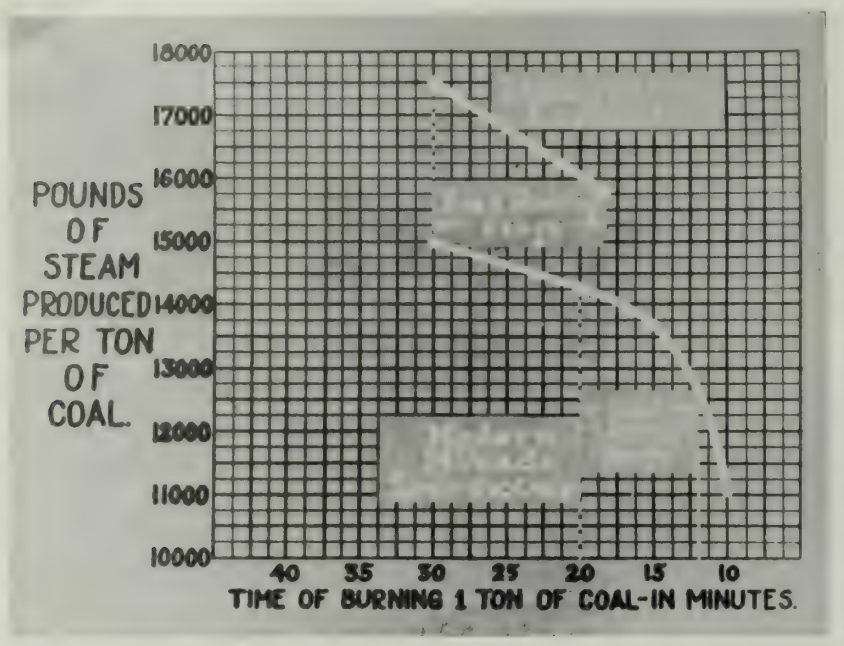
I do not want to imply that locomotive designers have ignored the maintenance problem. But I think it is a fair statement to say that fuel economy and increased power have received the major effort and that no change in fundamental design has recently been made especially directed toward reducing locomotive maintenance. In my opinion, one of the most important possibilities in future locomotive design lies in this direction, particularly as greater reliability and longer life of the machinery directly aid in the "long-run" program and more intensive utilization of power—which in turn will result in greater fuel economy.

There are naturally two major divisions in locomotive maintenance: the maintenance of the steam generating plant — that is, the boiler and its appurtenances—and the maintenance of the steam-using plant—that is, the engine with its running gear or, as commonly called, the machinery. The division of the cost of maintenance between these two general items appears to be roughly about one-third boiler and two-thirds machinery.

The solution of the boiler problem probably lies in some form of water-tube firebox, which will eliminate staybolts, and upon this problem much work is being done, although as yet there are comparatively few such boilers in service.

Improvements in the machinery portion offer possibilities which can be used at once. Moreover, machinery improvements offer the greatest chance for reducing maintenance costs by attacking the major part of this expense. These improvements can be made without going to any untried elements of construction.

This is a paper, illustrated with "movies" or lantern slides presented by W. E. Woodard, vice president of the Lima Locomotive Works, Inc., before the twentieth annual convention of the International Fuel Association, at Chicago, May 10.



It seems fair to assume that the new power purchased and new locomotive specifications prepared during the past two years indicate the trend of locomotive construction—even though the amount of new power represented is relatively small. Judged by this standard, there is not the slightest question about the railways approving the principles of low combustion rates, higher boiler pressure, limited cut-off, and booster.

How these features of construction have worked together to produce fuel economy, or have increased power output for equal fuel consumption, will be illustrated by a short series of moving pictures. These pictures are a summation of the various tests of the Lima A-1 locomotive and of some of the 200 engines generally duplicate of the A-1. These engines were the first to combine all of the elements of construction which I have mentioned and are now operating on many different railways under a wide range of conditions.

The pictures begin with the story of how low rates of burning coal in the firebox have benefited steam production shown above.

Higher boiler pressure with limited cut-off has had a marked effect in reducing the amount of steam used in the cylinders for a given amount of work. This is illustrated in the following table.

Now, the combination of these two factors—low combustion rates and high pressure limited cut-off—react upon each other to produce the results shown on the opposite page.

Indicated Horsepower Avg. Over Division	Total Water Per Hour Lbs.	Steam Per I. H. P. Hr. Lbs.
	A-1 (60% MAX. CUT-OFF)	
1,800	37,400	20.8
1,900	39,200	20.6
2,000	41,200	20.4
	2-8-2 (90% MAX. CUT-OFF)	
1,800	44,700	23.8
1,900	46,900	24.7
2,000	51,200	25.6

This represents an average saving of 17½% by the limited cut-off locomotive.

The booster also plays an important part in the combination of elements mentioned by providing a balance between the starting power of the locomotive and the increased tractive power at speeds produced by the limited-cut-off cylinders operating with high pressures. Stated in somewhat different form, the booster enables a limited-cut-off locomotive easily to start a train which it is capable of pulling at fairly high speeds under average operating conditions. The use of the booster in this combination is shown in Slide IV on Page 80.

In the design of the machinery of a locomotive two fundamental dimensions receive, or at least should receive, major consideration: these are the lateral distance between frame centers and the lateral distance between cylinder centers. These two dimensions, commonly called frame centers and cylinder centers, with the piston thrust or load which is set by the size of cylinder and steam pressure, determine the major stresses which come upon the machinery portion of the locomotive.

As locomotives have increased in size and power, the distance between frame centers has steadily decreased while cylinder centers have, on the other hand, spread out, resulting in greatly increased leverage or bending moment about the frames. As a result, bending moments on frames, axles, and pins, as well as bearing pressures on all journals, have increased in magnitude until now they are many times those existing on locomotives built only a few years ago. No presentation of figures is needed to prove this point. Anyone who rides locomotives of great power has felt the working of these enormous forces upon the locomotive structure.

The suggestions I present attack this fundamental problem by offering a way to decrease these stresses materially by reducing the distance between cylinder centers. They also provide a more substantial connection between the cylinders and the main frames, as well as a rigid unitary support for

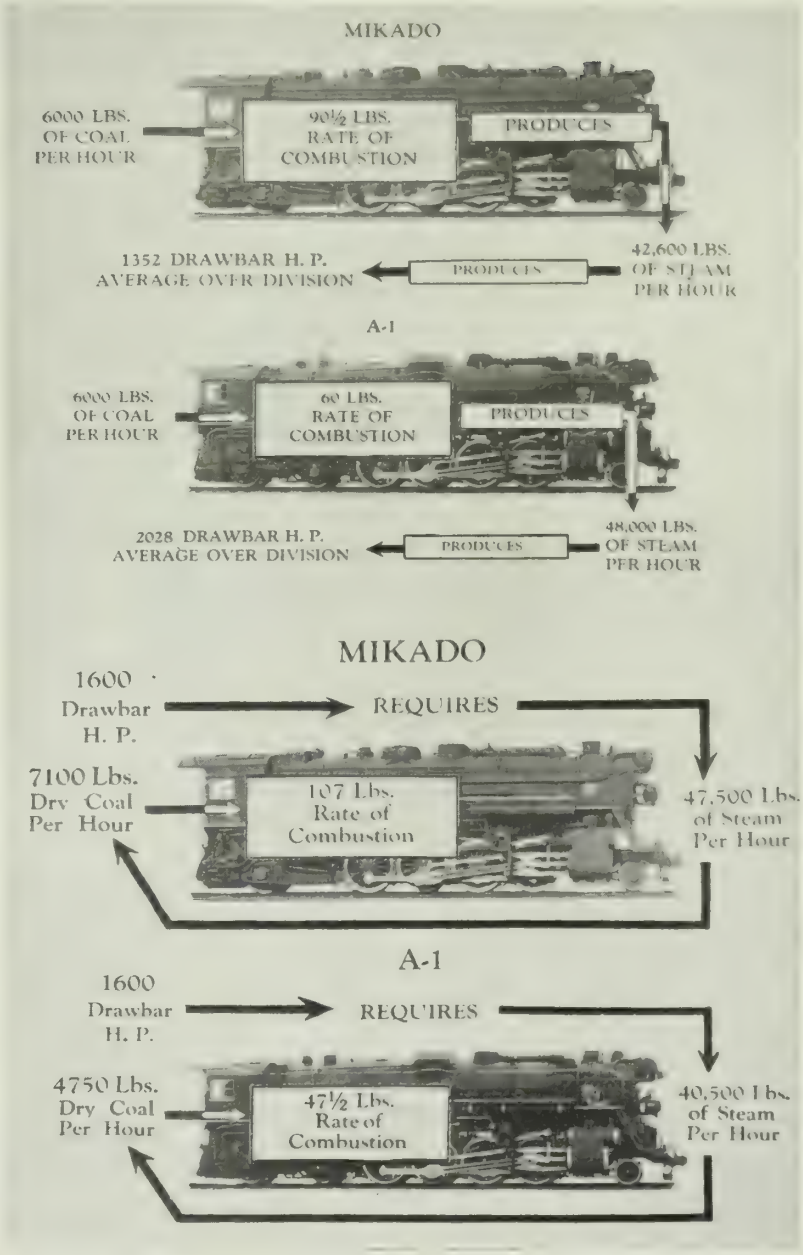
the guides and valve motion. All three of these elements of design are vital to the maintenance problem. Slide No. 1 shows the steps by which the new designs were evolved.

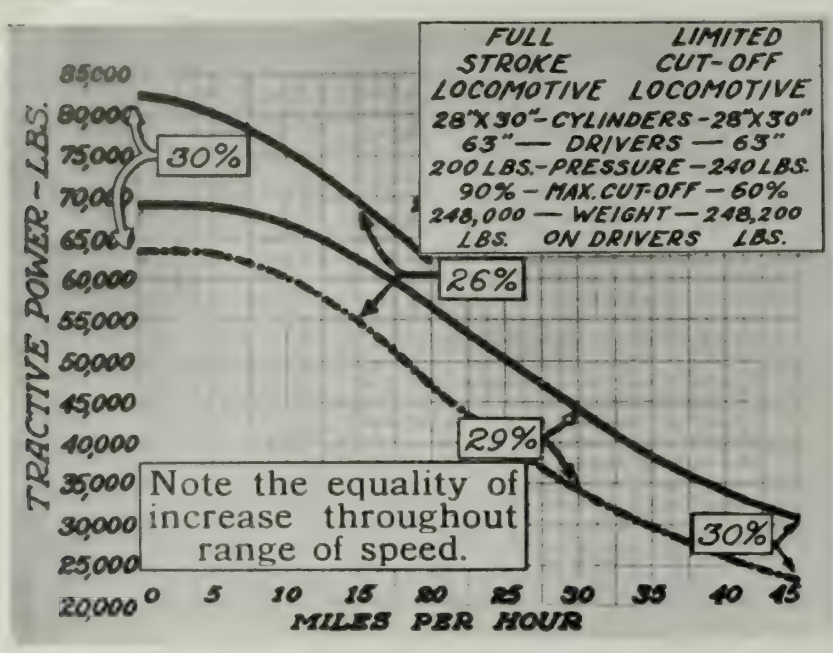
The guides are moved slightly ahead of their ordinary position, so as entirely to clear the pin and rod on number one driving wheel, thus allowing the cross-centers of the guides and cylinders to be pulled inwardly. The main rod is connected to the second driving wheel and, on account of using the Tandem Main Rod Drive, the force required to turn the back drivers is transmitted directly to them without going through the main side pin, as is the case with the ordinary arrangement. This leaves the main side pin with only one driver to turn, thus making it possible to cut down the length of this bearing. This new arrangement makes possible the building of the heaviest type of locomotive with only 88″ cylinder centers, a decrease of 5″ to 7″ over recent large locomotives. This means a reduction of the bending moment on the frames, axles, and pins of as much as one-sixth, which is a significant decrease in view of the magnitude of these forces.

The slide also shows the effect of the arrangement in the overall width of the cylinders. The relief afforded in this one item alone is at once apparent to the mechanical officers who have for years been trying to squeeze their locomotives inside hard and fast width limits.

Another advantage which follows is the possibility of using standard cross-cylinder centers for all sizes, thus securing a far greater interchangeability of parts than is possible when cylinder centers change with each different design.

Still another very important point in this arrangement is the manner in which it lends itself to a construction involving a unitary engine machinery support. This single casting incorporates the cylinder saddles, bumper bracket, deck casting, and front frame filling, with integral valve gear and guide supports. It provides an unusually fine bolting connection to the main frames ahead of the first driver and is also bolted to the smokebox at the saddle in the usual way. The shaded portion on Slide 2 indicates the unitary machinery support casting. This slide shows the application of these principles to a 4-6-4 locomotive. It clearly shows how the arrangement provides for a rigid integral support for the guides and the valve motion. It hardly needs any discussion in detail to show the desirability of a solid support for the guides which will insure against any bending or distortion. While the design shows a single-bar type of guide, such, for example, as used on the Pennsylvania Railroad's heavy power, there is ample space in the design to provide an equally rigid support for the ordinary Alligator type of crosshead and guide. In the application to this class of power a reduction in cylinder centers of about 5″ or 6″ will be secured, bending moments reduced about one-sixth, and the main boxes relieved of more than one-half their usual





work. Please note also the very fine connection between the unitary machinery support and the main frames.

Slide No. 3 shows the application to a locomotive of the 4-8-4 type.

With this type of locomotive cylinder centers of 94″ or 95″ are required with the ordinary construction. With the arrangement of which I am speaking cylinder centers of 88″ can be secured, thus reducing this dimension by 6″ or 7″. The same kind of support for guides and valve motion is afforded as before described for the 4-6-4 design.

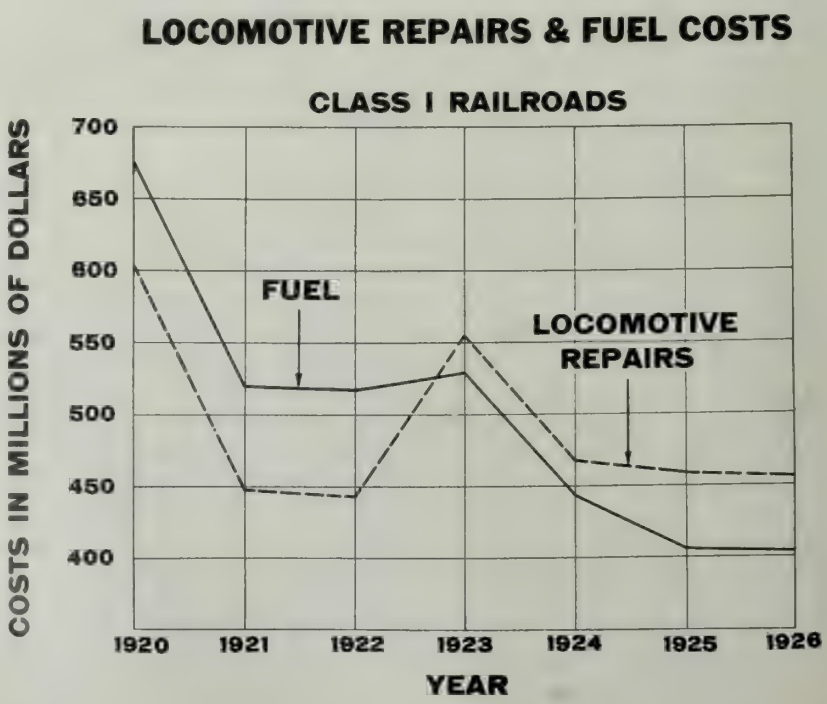
In any of these designs, the cylinders may be cast integral with the machinery support, as illustrated in Slide No. 4. This slide shows in a little more detail the integral valve motion support and guide supports, as well as the connection between the unitary machinery support casting and the main frames.

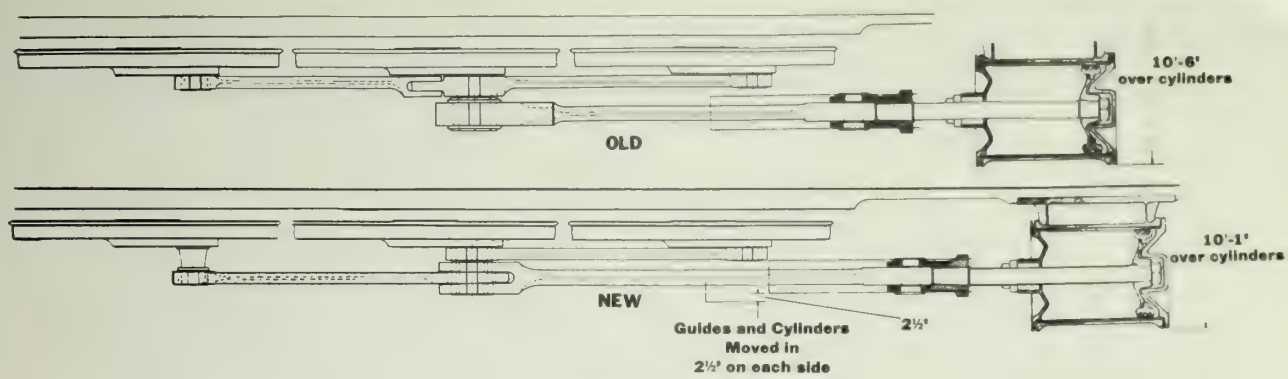
The use of this principle is not confined to locomotives having a four-wheel leading truck. A very satisfactory application has been worked out for a two-wheel-leading-truck locomotive and this will be shown applied to a locomotive having six pairs of coupled drivers, although it is equally applicable to engines having a lesser number of driving wheels. (See Slide No. 5.)

It would be entirely impracticable to build such a locomotive as this with the ordinary design of cylinders, rods, pins and axles, as cylinder centers would have to be placed 96″ or 98″ apart, with a corresponding heavy bending moment on the main axles, crank pins, and other parts. The cylinder centers on the design shown are 88″, a decrease of 10″ from the distance required with the ordinary form of construction, were it physically possible to apply it.

This design is in the range of locomotive sizes where the Mallet has been the only unit which the designer could offer. The new design therefore shows the possibilities in a field of motive power where maintenance costs have always been high and where a design which promises a reduction in this item of expense is well worth consideration.

The six-wheel trailing truck is shown in the design for the reason that it is necessary to have a fire box of very large size economically to produce steam for the large cylinders. In the design presented a firebox with 151 sq. ft. of grate area is contemplated. There will be nothing revolutionary or troublesome in a six-wheel articulated truck, as the practicability and safety of four-wheel truck designs have been proved by their use on about 200 locomotives operating in a wide range of service.





Slide No. 1.

The possibilities of this design can best be understood by a comparison with a typical heavy simple Mallet of about equal driving wheel weight. See table on this page.

You will note that although the two engines each weigh approximately 600,000 lbs., the 2-12-6 design has a 24½% increase in boiler capacity, which is readily accounted for by the omission of one pair of cylinders, guides, rods, etc., and two pairs of driving wheels. The real measure of usefulness of the locomotive is boiler capacity; it is the factor which determines what the gross ton-mile output will be. As far as the construction details are concerned, the bending moments in the 2-12-6 are actually within the limits of several existing locomotive designs, and while some of the features may appear to contain innovations, as a matter of fact there is nothing in the elements of this design which has not a sound basis either in development already done or by comparison with existing practice.

Now, what improvements could be expected if these suggestions were incorporated in a locomotive?

It is at once apparent that a material decrease in width over the cylinder would be secured. Or, within a given width limit a considerably more powerful locomotive can be built.

There would be a substantial decrease in the maintenance of the driving boxes, rod bearings, and other parts over engines constructed with the conventional cylinder arrangement and rods. This statement can be made with certainty, for the reason that there are now available comparisons between Tandem Main Rod Drives and the ordinary rod drives operating under similar conditions and with the same cylinder cross-centers. These comparisons show a decided improvement with the Tandem Main Rod construction in maintenance of both the rods and the driving boxes.

It is evident that a very much more substantial connection between the cylinders and the frames can be secured, as there is a much larger space available for bolting.

Based upon the experience with existing Tandem Main Rod Drives, mentioned above, it can be predicted with certainty that the racking of the frames and frame connections would be much reduced.

Counterbalance conditions would be much improved, on account of the decreased offset between the planes of movement of reciprocating parts and the balance blocks.

There would appear to be little argument that supporting the guides and valve motion on an in-

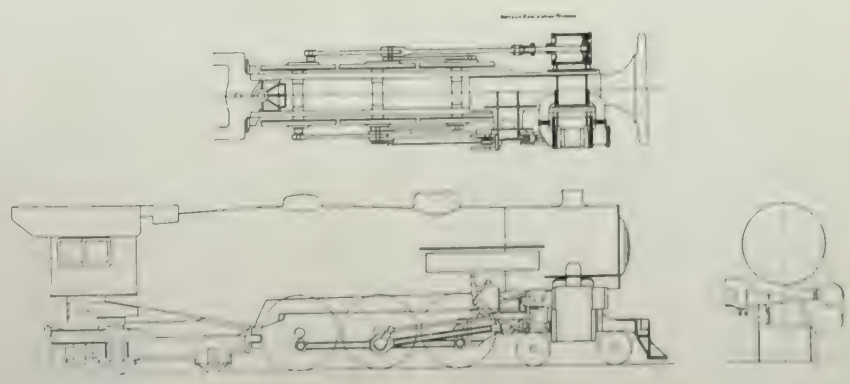
COMPARISON OF 2-12-6 AND 2-8-8-2 SIMPLE MALLET

	2-12-6	2-8-8-2
Tractive power, total	130,000 lbs.	130,000 lbs.
Cylinders	2-32"x32"	4-28"x32"
Driving wheel diameter	63"	63"
Total weight of locomotive	600,000 lbs.	600,000 lbs.
Boiler capacity lbs. steam per hour	99,600 lbs.	80,000 lbs.

This is a measure of the capacity of the locomotive to produce power at speeds—or gross ton miles per hour.

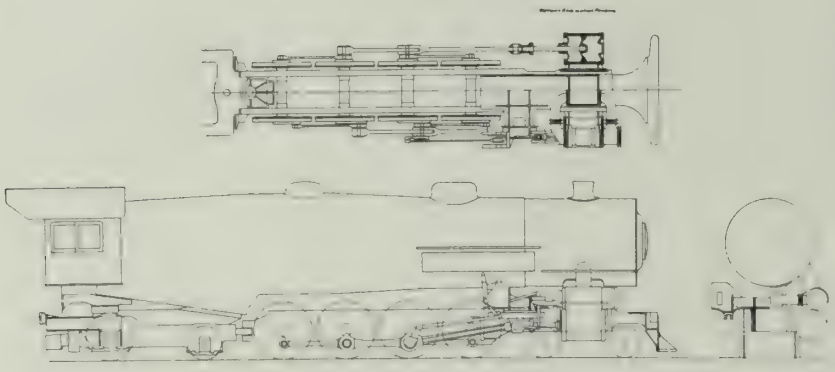
The 2-12-6 provides 24½% more boiler capacity than the Mallet.

4-6-4 WITH UNITARY ENGINE MACHINERY SUPPORT



Slide 2.

4-8-4 WITH UNITARY ENGINE MACHINERY SUPPORT



Slide No. 3.

tegral casting which is either cast together with the cylinder barrels or directly connected to them would result in a marked improvement in the up-keep of the guides and valve motion. Moreover, there is ample space to make this casting very rigid, thus insuring the permanent alignment of these parts relative to each other and to the cylinders.

While these suggestions apply particularly to locomotives of great power, the principles are useful in any designs and sizes. The various points have been presented in outline only. But if you will take the designs shown and analyze them, you will find that each step has a firm foundation in existing practice and what may appear somewhat novel is only the logical development of things already tried and proved.

The designs offer, I hope, some help in a problem of great magnitude. From the interest displayed by the few railroad mechanical men with whom I have had an opportunity to discuss these features of design, I venture the prediction that soon we shall see locomotives in service embodying these improvements.

Perhaps some of you will wonder what effect these proposed new features of design will have on fuel economy. In answer to this, it is my opinion that the increased reliability of the machinery parts brought about will directly aid in the long-run program and intensive utilization of motive power, which, in turn, results in still greater fuel economy.

The steady reduction of fuel costs as compared to maintenance costs shown previously in this paper brings out forcibly the results which have been obtained by railroad men who are directly responsible for this large item of operating expense.

Water Costs for Locomotives

By O. O. Carr

Labor, treating and repair material costs for water, vary according to location, volume used and whether necessary to treat. These costs for treated water vary from six to nine cents a 1000 gallons delivered to the locomotive tank. Some of the larger and more favorably located stations can produce water from 1½ to three cents; the average, both kinds, all stations being about seven cents.

Estimated water versus coal consumption on the average superheated locomotives **not** equipped with other fuel saving devices may be estimated as follows:

One pound of water makes one pound of steam.

One pound of steam condensed in boiler, makes one pound of water.

One pound of coal evaporates 6.1 pounds water from average tender temperature to 212 degrees steam in a superheated engine or one ton coal (2000 lbs.) evaporates 12,200 pounds water.

12,200 pounds water equal to 1471 gallons (8.3 lbs. per gallon).

1471 gallons water equals 1.471—1000 gallons water.

Coal at $3 a ton evaporating 1,471-1000 gallons of water at seven cents per 1000 gallons, or $0.10297 makes water cost 3.4 per cent of coal costs.

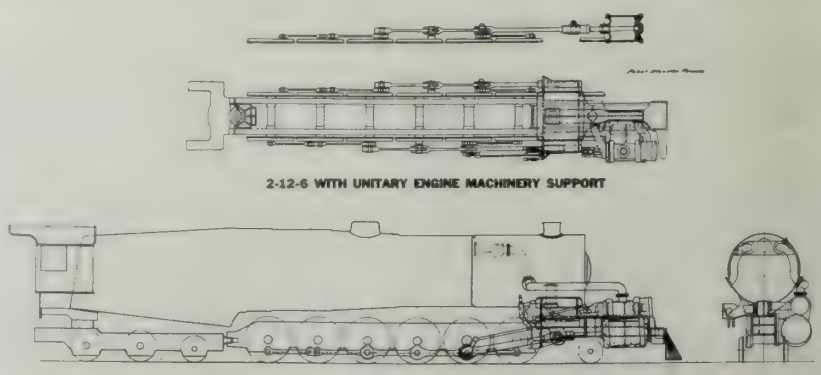
The same formula of consumption applied to a superheated locomotive also equipped with feedwater heater and other fuel saving devices will show about as follows:

One pound of coal evaporates 8.3 pounds water from feedwater tender temperature of about 60 degrees.

2000 pounds of coal evaporates 16,600 pounds of water, or 2,000 gallons.

Coal at $3 a ton, water at seven cents per 1000 gallons or 14 cents per 2000 gallons, (the amount 2000 pounds of coal

(Continued on Page 80)



2-12-6 WITH UNITARY ENGINE MACHINERY SUPPORT

Slide No. 5.

Lancaster Yards, the New Modern Terminal of the Texas & Pacific Railway At Fort Worth, Just Completed. A View Looking East From the Hump.

New Yards and Shops for the T & P

Four Million Spent at Ft. Worth

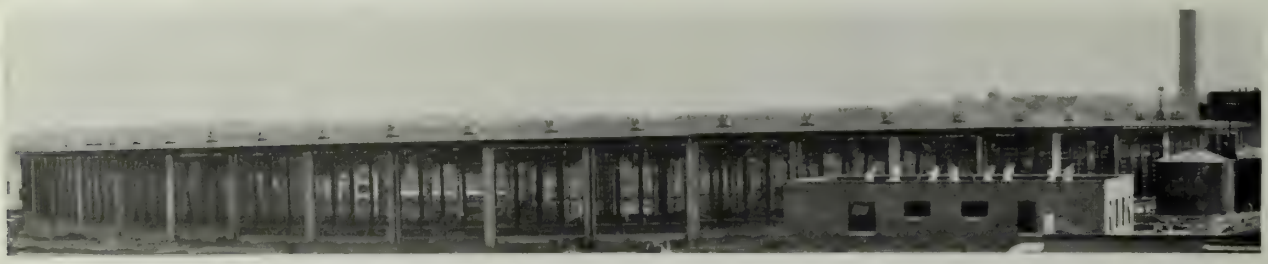
By Wesley Monroe

IF YOU are an old railroad man, old enough to remember the days when it took nearly everyone in town, all the train crew and most of the yard force, to sort out forty or fifty cars and make up a train in some kind of order; the days when the dirty little switch engine had to pull everything back and forth several times; when a man with a hickory club rode thousands of miles, it seemed, and hot-footed it just as much, cussing away what chances he might ever have had for a happy hereafter—

If you are that kind of railroader or if, perchance, you are still working under the same old inefficient methods, it will do your heart good to see the modern yards and shops of the Texas & Pacific Ry., at Fort Worth. There are larger lay-outs in several parts of the land, but nowhere is there anything more modern or anything working more smoothly and satisfactorily than Lancaster Yards, now practically finished.

The Creator did a particularly fine piece of work in planning that part of Texas. Topographically, it seems intended for a gravity or hump yard, and the company's engineering forces have overlooked no natural advantages in preparing it for just that purpose. The property contains about 400 acres, three miles from the business center of Fort Worth, is about three miles long, and certainly is an ideal location for such facilities. The company has spent about $4,000,000 on the new development, and if traffic growth and energetic management continue as at present much more will have to be put into additional trackage. Certainly more room will be needed soon in the classification yard, the oil industry having determined, apparently, to put the Texas & Pacific into a place dangerously near those affected by the detestable Recapture Clause.

The new yards contain 60 miles of tracks, all fully floodlighted. At the west end is the receiving yard for both east and west bound traffic. Following this, farther eastward, is the classification yard while at the east end are the east and west bound departure yards. East of this are the enginehouse facilities and shops. At the east end of the west bound departure yards is the freight car repair yard. Yards and shops and all other terminal facilities are placed between the company's main tracks, the west



The New Enginehouse at Fort Worth Has 32 Stalls, Direct Steaming Connections for Engines, and a Three-point Turntable.

bound on the north side and the east bound at the south.

The latest type of car retarders and switches electrically operated, are the special pride not only of President Lancaster, under whose administration the Texas & Pacific has come up from the doldrum days of receivership into comparative prosperity, but of all the men employed in the yards and in the whole operating department. Men who have lived and worked under the old, cumbersome, slow methods of other times find a keen satisfaction not easily understood by the uninitiated when the cars in a cut pass over the hump, rapidly and smoothly, their weight recorded by plate fulcrum scales as they pass, down into the classification yard to the tracks on which they belong, guided and their speed controlled by the retarders and these by a man in a central tower moving a lever about the size of a carpenter's marking pencil. Retarders are commonplace now in several parts of the country; they are still a novelty in Texas, and a very efficient and economical one at that.

For at least two important reasons the new enginehouse is more than ordinarily interesting. It contains 32 stalls, which already is much too limited for the company's growing business, is 120 feet deep, and about as clean and free from objectionable smoke and gas as any such structure ever gets to be. This is because the enginehouse is equipped with a direct steaming system, coupled with the washout system so that engines are not fired until they go outside for service. With a pressure of 100 to 125 pounds of steam applied from the main boiler plant they pass out to the fuel-oil and water supply, and in 40 minutes are ready for the road. Furthermore, no engine is taken into the house until it has first stopped at the so-called locomotive laundry where the outside is thoroughly cleaned.

Practically every modern facility any master mechanic could desire has been installed from locomotive inspection pits, sand dryers and what not to a 105-foot turntable on 3-point bearings. Perhaps you remember the old style table

Division Storehouse in the New Fort Worth Terminal.

During Construction of the Erecting Shops in the Texas & Pacific Terminal at Fort Worth.

The Erecting Shops Are Ideally Located, Well Lighted, and Have Every Necessary Modern Auxiliary Plant and Accessory Conveniently Placed.

on which you had to balance your engine or get into trouble.

In the power plant are two 500 hp. high pressure boilers supplying steam used in the enginehouse. Natural gas is burned here, but if the gas supply should fail oil can be turned on within a few minutes. One more boiler is soon to be added.

The main shop, still partly incomplete as to machinery equipment, is 300 by 400 feet and is exceptionally well-lighted. Nearby are material yards, the new division storekeeper's buildings, the main one of which is 55 by 200 feet, an oxweld plant, and other accessories of a thoroughly modern railway yard, supply and repair plant.

Work on the site for Lancaster Yard and shops began about a year ago. Since then 1,111,000 cubic yards of grading and excavation work has been done. The grading was done by the D. A. Foley Co., of Los Angeles, building construction by the Austin Company of Cleveland, and the track work by the railway company's own forces. The entire project has been carried forward by the chief engineer, E. F. Mitchell, with F. R. Naylor, his assistant directly in charge of construction.

Texas Electric Wants Freight

At Waco, Texas, May 22, a public celebration was conducted, quite enthusiastically, too, marking the entry of the Texas Electric Ry., into the freight carrying business. The Texas Electric is a standard gauge line about 280 miles in length serving a large territory in which are many towns and several cities, among them Dallas, Denison, Corsicana, Sherman, Waco and others. Interchange of cars at Italy, 45 miles from Dallas had been arranged with the Missouri Pacific. The first car of freight for delivery to that line destined to Odessa was given the company for the celebration by the Texas Power & Light Co.

"Something had to be done," said James P. Griffin, vice president in charge of operation, a few days ago. "The passenger business has dwindled for us as it has for the steam lines. Naturally, we turn to freight. The railroads have given us every courteous evidence of cooperation."

The Texas Electric has done about everything such a line could do to encourage passenger traffic, but not with very great success against the competition of the private motor car. The company's equipment is thoroughly modern, comfortable and even luxurious. A vote of its patrons was taken recently to determine the kind of seat upholstery they preferred. Leather received the majority vote, and consequently the company is now tearing out the plush and substituting the best of overstuffed leather. Aisles have in some cars been narrowed and the seats widened. Special compartments have been built in for baggage and lavatories.

High standards of performance are being set by the state-owned railway of South Africa. One of the crack trains, the Union Express, on the Cape Town-Johannesburg run, travels its 900 miles in 28 hours, during which it has to climb from sea level to an altitude of nearly 6,000 feet.

Among the Men Who Do the Work

THE chief clerk of a railway passenger department on a busy day is about as energized an individual as can be found among the myriad activities of a big railroad terminal. Passenger work during a period of busy travel comprises an endless succession of emergencies, and the weight of these falls on the chief clerk. The reason for his busy life is not far to seek, for he is at the meeting point of two great tasks—detail work and general supervision.

He is responsible for the work of subordinates, who are as prone to error as most human beings, and the chief clerk must be in a position to control the results of their labors. At the same time he is in charge of affairs that may touch upon the whole policy of the department and in the absence of his superior may have to make decisions that involve a broad grasp of railroading principles.

Theoretically the duties of a chief clerk of the passenger department of a railroad cover three main fields. He must handle the details of transportation requests from the different parts of the system and see that they are met effectively. He must give orders for the printing of tickets and their distribution to the different offices. He must direct the handling of Pullman car and dining car runs and the distribution of Pullman reservations. In short, the chief clerk should be able, in the absence of the general passenger agent, to handle virtually every problem of passenger traffic except advertising.

The usual road to chief clerk is the classic one of beginning as an office boy. A bright office boy in a railroad office has a very fair chance of becoming a clerk, and from a clerkship there is no difficulty in advancing to chief clerk in the course of the usual copybook progress of hard work and patience.

An 1865 Time Table

An original copy of time table No. 2 of what then was the Union Pacific Railway, eastern division, effective January 1, 1865, is a new exhibit in the Union Pacific historical museum. Among the special rules and regulations printed on the time table sheet is included the following: "Trains will not run on Sunday except to complete trips commenced on Saturday, except construction trains by special orders of the general superintendent." Among the general rules which occupied the whole reverse side of the sheet was included: "Run as near as possible to table time. No excuse will be received for running ahead of time. Dispatch business as quickly as possible, and use the whole time equally between stations. Engineers must run with caution when behind time, safety being the first consideration."

The Wonders of a Watch

I have in my possession many watch inspection circulars signed by the late Webb C. Ball, and approved by the General Managers of railroads, that read as follows:

"While the foregoing schedule for new watches includes 21, 23 and 24 jeweled grades, the results of experience have proved such high jeweled watches impracticable and 'short lived' for railroad service. Their complicated and delicate construction renders them liable to get out of order easily; difficult and expensive to repair. The efficiency and safety of the time Service is thereby impaired and the cost of maintenance of watches is increased to employes. Therefore, it is suggested and recommended that employes, when purchasing new watches for use in railroad service, should select 17 or 19 jeweled grades."

A watch is a most wonderful and very delicate piece of mechanism and like the human system, needs the utmost care and attention to keep it in a healthy condition. This marvelous little machine is the result of hundreds of years of patient study and experiment by the most expert watchmakers. Step by step it has been developed until the watch of today has reached such a high state of perfection that there is little more to be desired.

Notice the busy little balance wheel flying to and fro unceasingly day and night, year in and year out; 18,000 beats or vibrations per hour, 432,000 per day, 12,960,000 in thirty days, 157,680,000 in one year. It travels one and forty-three one-hundredths inches with each vibration, which is equal to nine and three-fourths miles in twenty-four hours; 292½ miles in thirty days, or 3,558¾ miles in one year.

Pioneer Railroading Problem

An engineer, surveying the right of way for a proposed railroad, in 1870, was talking to a farmer.

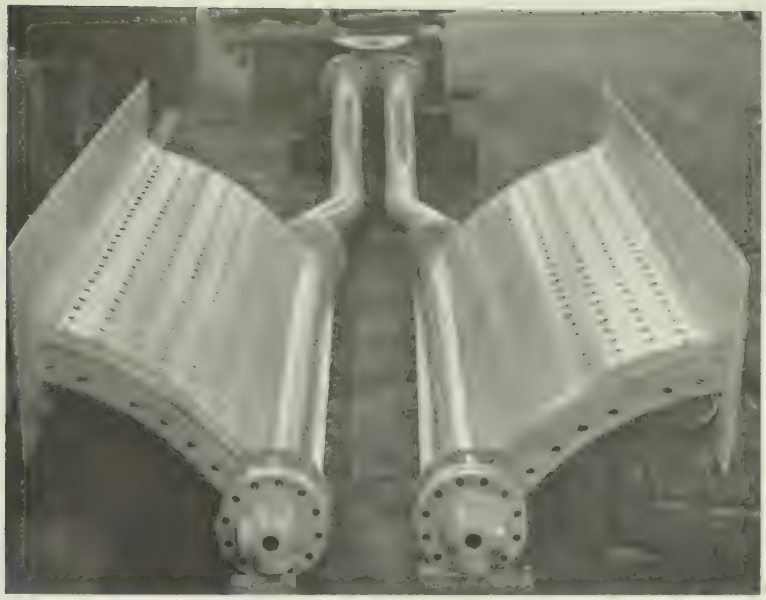
"Yes," he said, "the line will run right through your barnyard."

"Well," answered the farmer, "ye can do it, if you want, but I'll be jiggered if I'll git up in the night just to open the gate every time a train comes through."—Capper's Weekly.

The best way to strengthen your judgment is to exercise it.—Sunshine.

A Water Table Under the Fire Box

By James W. Haskell



The Martin Water Table for Oil Burning Locomotives.

IF YOU are interested only in the technical, scientific characteristics of the 541 it won't take long to give you the facts. As bald statements of economy and efficiency in railroad operation they are startling enough, goodness knows, but not especially thrilling for the ordinary run of human beings in this reading, thinking world.

These are the essential points to emphasize: The 541 is a Santa Fe Type freight locomotive, to be referred to hereafter as "she," owned by the Texas & Pacific Ry. Up to a few months ago she was doing about the same work as other engines in the freight pool on this progressive road, and doing it in the same way. It was costing about the same money to keep her in trim for road work as it cost for other engines.

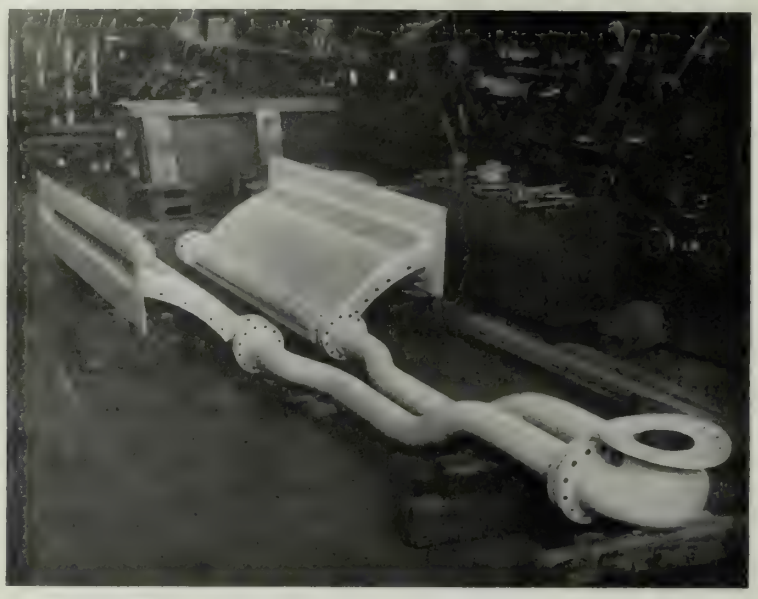
The 541 is still doing the customary work, but she is doing it at a very much lower figure for the company and, consequently, for the public which, eventually, pays all the bills. In a word, as your minister says, if you have one, the 541 burns about 11 per cent less fuel oil than formerly, and this oil evaporates 14 per cent more water per pound of oil, that is it makes more steam, than the same oil burned in other engines on the Texas & Pacific. There has been no magic in this. The change has been brought about by building in the bottom of the firebox a water-heating surface—in effect an auxiliary boiler in a space hitherto non-productive.

The change in the 541 began when someone did something to her firebox. Certain changes were made. The customary performance records, holy papers in the master mechanic's opinion, began to show new figures and unusual facts. Grave faced mechanics, superintendents of motive power, vice presidents of operation, occasionally a hopeful-looking president eager for anything that seemed to promise economy, began journeying from distant places to the fine new shops of the T & P at Fort Worth to see the 541, to listen to the story the men in charge were telling, and then to smile.

Now, to those who don't know very much about such things, and even to those who do, the locomotive firebox designed to burn coal has always been just a room with walls and a ceiling but no floor. True, there were grate bars which didn't form much of a bottom; and in this condition the firebox has remained since fireboxes began.

Even after oil came along as a fuel for generating steam, scarcely any change at all was made in this part of the locomotive. Indeed it has been a repetition in a larger way of the old coal burning furnace at home and in the industries, converted hastily and often rather clumsily into oil burning contraptions, with the result—as in locomotives—inefficient operation and poor returns, big oil bills and not enough heat.

Don't blame the railroads. In the main they have taken advantage of the products of inventors, when they had the money. If the old mud ring firebox has remained the standard construction of the modern as well as of the superpower locomotive boilers of today don't cuss the railroads. It is about all they can do to keep within hailing distance of the vanishing net return and avoid homicidal outbreaks between master mechanics and federal inspectors of locomotives. Once convince a railroad executive, however, that some-



Close-up View of the Pipe Construction of the Martin Water Table.

thing you have will cut down his operating costs and he will buy it if the purchase can be made without incurring the wrath of commissions here and there, not overlooking the shrinking directors and stockholders.

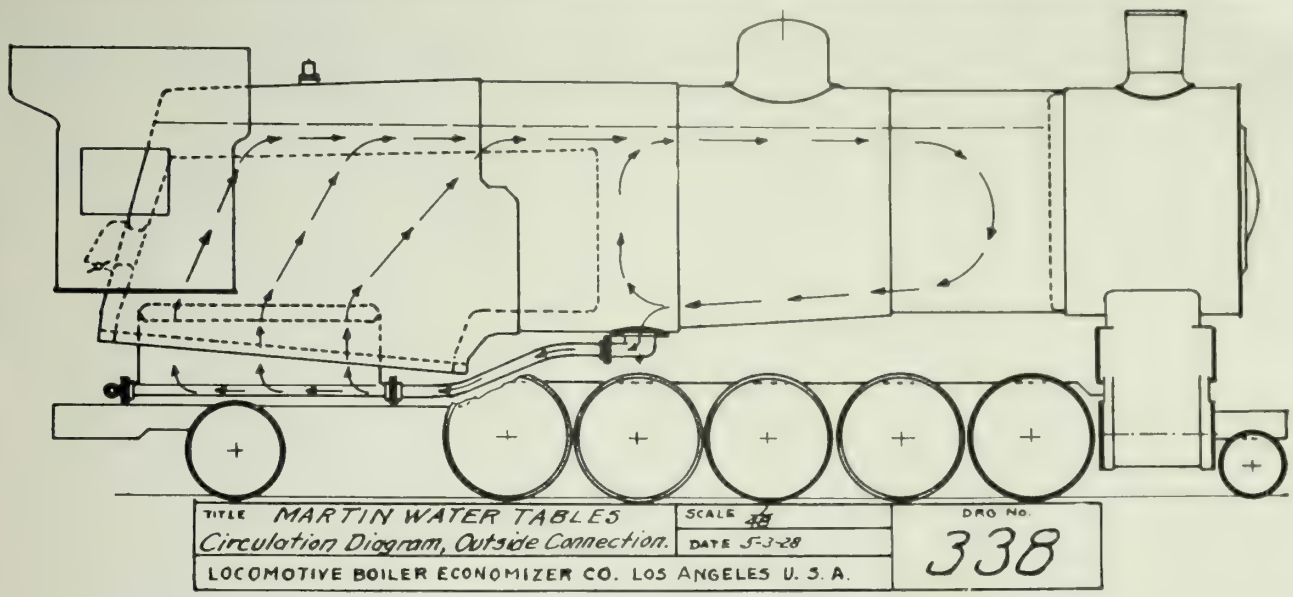
The trouble with fireboxes has been that up to the present no one has come along with a practicable substitute or improvement sufficiently impressive to warrant oil-burning railroads in making a departure from their time-worn practice of converting a coal-burning firebox to the uses of oil. The problem for scientific minds to solve has been that of turning this coal-burning mud ring firebox into one adapted to oil so that the heat of combustion, as well as the particular properties and advantages of oil as a fuel might be utilized to the maximum. To provide in fact a construction without making any radical changes from existing standards so that should the necessity arise to return to coal the complete change could be effected in a few hours. To this end, the Martin oil burning locomotive firebox has been constructed on the principle that the bottom could be utilized in providing water circulating steam generating surfaces which would be in an advantageous position to receive the flame play from the burner and heat of combustion within the firebox.

It was deemed just as logical to utilize the bottom of the firebox as to use its sides and top in the burning of oil by replacing the fire pan as appended below the mud ring with water circulating steam generating tables or elements, which now serve as the bottom. By feeding the table or bottom with water from the barrel of the boiler a continuous circulation of the colder water would be provided by way of the tables into the side water legs of the firebox. The effect of this is dual in that the tables not only increase the active heating surface in the bottom of the firebox but also are the means of causing active circulation of water in the side legs now dormant a considerable distance over the mud ring, and on account of being dormant requiring the protection of a refractory brick covering along the side sheets.

The circulatory movement of the water from the boiler through the water tables into the water legs is occasioned by the difference in thermal head existing between the colder water in the shell of the boiler and the heating of this water in its passage through the tables. The result has been a lightening of the water in the side legs owing to its having steam bubbles, and its continual displacement by the colder water from the boiler barrel. In other words, the specific gravity of the water passing through the tables is lightened by steam bubbles generated within the tables as exposed to the heat of combustion of the fuel oil. The water tables act as generating surfaces not only to cause the active movement of the water through themselves but cause the steam line to be brought down the water legs from its present position below the crown sheet, thereby materially increasing the capacity of the side sheet heating surfaces; the burden of the heating causing the colder water of the boiler barrel to be generated into steam being taken by the tables.

As already indicated the object has been to give to the oil burning railroads a simple and efficient arrangement without any radical departure from the present standards, while taking advantage of all of the properties contained in the combustion of fuel oil. With this point in mind, the water tables are depended downward below the mud ring to form the deepest possible combustion chamber, and to present curved convex sides to the fire. In this manner the firebox combustion volume so highly important in burning gaseous types of fuel, such as fuel oil, is maintained at its maximum, while utilizing the table heating surface exposed to the flame play and radiant heat of the fire to the greatest possible advantage.

The photographs show clearly how the tables are constructed; providing in substance a continuation of the water legs of the firebox when attached by their flanges to the side sheets and mud ring. These are built thoroughly in accord with federal and state requirements. In installing the tables, a strip of the side sheet is cut away about 18 inches above the mud ring, and the tables are substituted in place thereof, being welded along their upper flanged edges to



the side sheets and riveted on their lower flanged faces through existing mud ring rivet holes to the mud ring. This is in accordance with standard practice, the installation being inexpensively and expeditiously made by reason of the small amount of welding required and the straight work of attachment to the mud ring. Should occasion arise at any time to return to coal, the tables can be removed quickly by a cutting torch, and a strip of sheet welded to the side sheets of the firebox.

As illustrative of the manner of taking the water from the barrel of the boiler to the tables, one form of water passage is shown. This, termed the outside connection, is made from the shell of the boiler by a cast steel Y-header, while another, not shown here, is called the inside connection, taken from the throat sheet of the firebox through flanged steel nozzle connection. The pipes or conduits carrying the water are made preferably of copper pipe and in accordance with the rules and regulations of the department of commerce for high-pressure pipes on ocean-going vessels. The copper pipes adapt themselves readily to all strains of expansion and contraction and on this account are ideal water carriers. The copper pipes carry cast steel flanges secured to the cast steel flanges at the lower front ends of the tables. Cast steel flanges on the tables also carry cast steel blowoff headers, to which latter right and left blowoff cocks are attached.

The Texas & Pacific Ry., always watching for improvements that insure economies, was quick to recognize the advantages and savings possible to effect by the Martin Water Table construction. Consequently, in September of 1927, the company ordered its application to Santa Fe Type locomotive 541. This locomotive has now been in service for eight months operating over the entire district of the Texas & Pacific in heavy pooled freight service under all water conditions, and has proved itself to be the most economical fuel performer of the 44 Santa Fe Type engines of its size and class.

A comparative test of fuel performance of the 541 and a standard engine of the same class shows that under adverse weather conditions, namely 16° F. to 30° F. as against 55° F. to 70° F., with standard engine, that the fuel saving was 11.2 per cent per 1,000 adjusted gross ton miles, and that the engine evaporated 14 per cent more water per pound of oil than the standard engine. Disregarding the difference in temperature, the summary of comparative average performance of these two engines follows, as shown on the test sheet of the Texas & Pacific in the table appearing on the next page.

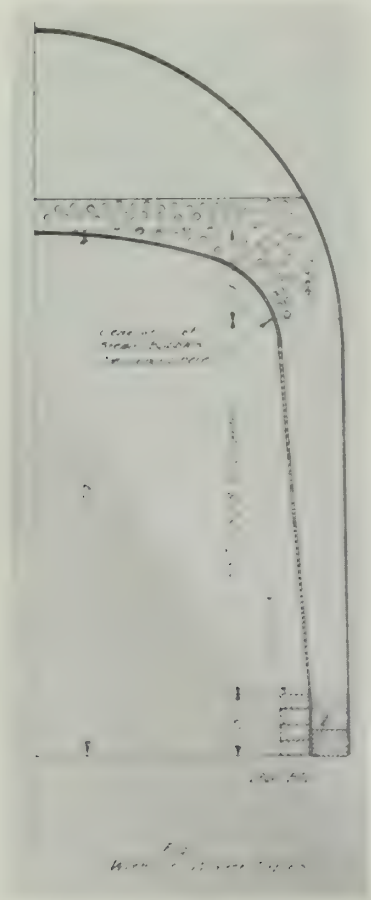
The fuel saving effected by this engine is so very substantial as to be worthy the attention of all oil burning railroads. In addition to the fuel saving, however, there is a very material saving in fuel oil used at terminals in firing up. A test at Big Spring, Texas, of Engine 541 and a standard engine of the same class showed there was a saving of approximately one barrel (42 gals.) of oil in bringing the two locomotives up to the same gauge pressure, all conditions being equal. This is accounted for by the fact that the tables immediately receive the heat and flame from the oil burner when fire is put in the engine, circulation of the water from the shell of the boiler through the tables and water legs starting simultaneously with the fire thereby causing the water throughout the boiler and firebox to be quickly brought to a uniform temperature. There is no longer a dead end to the mud ring in a water table equipped engine, and the great objection to firing up oil burning locomotives hurriedly with consequent strain of the firebox sheets, is eliminated.

There is a material saving in fire brick required as the water tables now expose bare water-carrying surfaces to the fire which previ-

ously were covered with brick. No fire brick is used on the side sheets of firebox or tables. The drawings of the Texas & Pacific installation show that a burner wall, flash wall and bottom floor between the bulbs or mud drums of the tables only, are used.

After eight months of continuous heavy freight service, the firebox of the 541, including the tables, has required little or no attention. In accounting for this it is desired to point out that an oil burning locomotive firebox equipped with these tables, eliminates the direct attachment of the side sheets of the firebox to the mud ring, substituting a longitudinally running expansion joint occasioned by the juncture of the table with the side sheet, the tables forming with the side sheets a loop which is brought around and secured by the bottom flange of the tables to the mud ring. In this manner the strains incident to the expansion of the side sheets are effectively compensated, and bulging of the sheet under heat of the firebox causing it to move inwardly toward the fire and off the staybolts is entirely done away with by elimination of the direct attachment or anchorage of the side sheets to the mud ring. By this efficient means of compensating side sheet expansion, staybolt leakage and breakage finally is reduced to a minimum. This fact no doubt will receive the full consideration of mechanical officers having oil burning locomotives, particularly on roads operating in foaming water districts where staybolt trouble is greatly aggravated.

Description	Averages Eng. 541	Eng. 534	Results, Per Cent	
Oil consumed, gals. per trip	1946	2180	10.73	Saving
Gals. oil per 1000 GTM (Actual)	8.38	9.24	9.3	Saving
Gals. oil per 1000 GTM (Adjusted)	6.98	7.86	11.2	Saving
Evap. lbs. water per lb. oil	11.89	10.42	14	More evap.
Time on road	5'55"	6'20"	25"	Longer 534
Actual running time	4'34"	4'24"	10"	More for 541
Per cent of max. rated tonnage handled entire trip	97.35	97.05	Practically same	



Proof of the value of the water table construction in preserving the firebox sheets was brought out practically in the operation of Engine 541 between Big Spring and Toyah, Texas, in the foaming water district of the Rio Grande division. Because of the shortage of rainfall and the highly concentrated condition of the water supply, it was necessary to brick the side sheets of the standard engines of the same class six staybolts high, whereas, Engine 541 operated under the same conditions without any brick on side sheets or water tables. Under these conditions of foaming water the 541 showed a stabilization of the water in the glass accounted for by the increased water holding capacity of the tables in the bottom of the firebox which gave the enginemen better control of the water than in the standard engine.

The tables provide at their bottom ends mud drums fitted with blowoff cocks making it possible to blow off from the lowermost point of the firebox and boiler. Adequate washout plugs are installed, which simplifies the removing of sediment from the boiler, and washing out and changing water.

This water table construction, having proved its practicability and efficiency over an extended period has now been placed upon the market by the Locomotive Boiler Economizer Co. of Los Angeles. The shop facilities of the company are such that it is offering delivery in Chicago for middle west and southern territory, and in Los Angeles for western and Pacific Coast territory. J. C. Martin, Jr., consulting engineer and president of the Locomotive Boiler Economizer Co., is the inventor and designer of the structure.

Getting Supplies There When Needed

Cutting Down the Inventory

By C. C. Fenimore

General Storekeeper, Pacific Elec. Ry.

GENERAL business conditions in the past few years have caused all industries to seek ways and means of decreasing their investments in values of stocks. In the case of manufacturing concerns this applies, not only to the raw materials, but to the manufactured products as well. While on the railroads it applies only to the raw product used in maintenance of track and equipment, they have not lagged behind in efforts to reduce investments to the minimum, and at the same time have needed materials on hand when and where required.

An Ideal Placing of Heavy Stores Near the Shops.

To accomplish this on the Pacific Electric system much depends on a very carefully planned distribution system, the most important link of which is the supply train, at least it is the most important from the standpoint of volume of material handled.

Our general plan of distribution provides that the bulk of materials be concentrated at one point, the Torrance general store, and that frequent distributions be made from that point to all points on the system. On account of the short time required to reach any point on the lines it is a rule, not only in the stores department, but in the using departments, that the stock on hand where it is to be used be maintained at the lowest possible point. The rule is that division storekeepers have not more than 30 days' supply on hand. Another rule is that a commodity on hand at a division store which has not moved in 90 days shall be returned to the central distributing point, from where it may be re-distributed to point requiring that item. The only exception to this rule is in case the item may be one required for protection of equipment used only on the particular division, or to maintain equipment in service where it can not be held.

The supply train operates on regular daily schedule from Torrance as the terminal. Mondays, Tuesdays, Thursdays, Fridays and Saturdays are largely devoted to distribution of material to division car repair points and the return of scrap, unserviceable or unneeded materials to the central distributing point. These division car repair points are reached from two to four times a week. Such frequent service is, to a large extent, made necessary due to the large number of types of railway motor equipment. Railway motor armatures particularly, as well as field coils, require frequent re-servicing which work must be performed by highly-trained specialized men. The same condition applies to many items of air brake and control equipment. This technical work is largely concentrated at the Torrance general shops where greater efficiency may be obtained, at the same time, preventing a very heavy outlay in the investment in value of spare armatures, field coils, compressors, brake valves and other spare equipment, which would be necessary to maintain cars in service without distribution system.

With armatures for our larger type of cars costing about $1,000 each, and with approximately 950 motor equipped cars and locomotives in service, many of them four motor equipments of 35 types, some idea may be gained of expenditure necessary to maintain cars in service without some method of frequent distribution. This plan of distribution permits many other classes of maintenance work also being concentrated at the Torrance general shops, rather than have each division point equipped with machinery and men.

Wednesdays are devoted to general delivery of materials along the line, to engineering department, track sections, to substations, to station agents, in fact, to all material users. Five weeks are required to cover the system in this manner. Material users are notified, well in advance of movement

—Wide World Photo.

Locomotive Models Built by C. A. Lehman, A School Teacher for the Pacific Southwest Exhibition at Long Beach, Cal., to Open Next Month.

of train, of the schedule that will be observed so that requisitions may be placed in sufficient time to have deliveries made on regular trip. Equal in importance to the distribution of materials where needed is the concentration of them from where not needed to the central point of distribution.

For car congested districts and emergency distribution, three motor trucks are in service. Two of these trucks operate from Torrance as terminal, one being in daily service between Torrance and Los Angeles supplying Sixth and Los Angeles streets, Main Street Terminal, Hill Street Terminal, Macy Street, and Sherman in emergency, and carrying emergency supplies to Torrance.

Another truck is maintained at Torrance, handling express shipments and Torrance yard deliveries. The third truck is maintained with the Sixth and Los Angeles street store as terminal. This small pick-up truck is used in maintaining our motor coaches in service, thus permitting the manufacturers' agent to carry the investment in materials needed to maintain equipment rather than for the company to carry heavy investments in such materials. As a result of this service our investment in automobile materials, including motor coach and truck supplies, exclusive of tires, is only slightly over $100 per unit.

At the Torrance general shops distribution of materials is made from the general store by stores forces to the bench, machine or car on which the material is to be used. This plan in addition to reducing shop stocks, by the foreman having knowledge that he can obtain delivery of materials within 30 minutes to an hour, prevents loss of time by skilled mechanics in calling at the store for material.

Here, too, the idea of re-concentrating scrap, unserviceable and un-used materials is followed out, since store delivery service includes the picking up of such materials from the shops and returning to store.

Through the distribution system, the cooperation of using departments and other effective means, values of stock on hand from September, 1924, to September, 1927, have been reduced more than one million dollars, and the turnover from approximately two times a year to three times a year. These figures include value of rails, ties and other materials, which on account of market conditions are sometimes necessary to be purchased in advance of requirements.

The Long Beach Exposition

Traffic men in all lines of transportation are turning their attention to a new objective for passenger business this summer—the Pacific Southwest Exposition, which opens at Long Beach, Cal., July 27 and is to continue through August. The railroads, trolley lines, steamships and motor buses operating along the Pacific Coast have started their preliminary plans for obtaining a large volume of traffic to the exposition, and the transcontinental railroads from Southern California to the East are offering special inducements in materially reduced fares to the exposition, which is assuming impressive proportions, 25 foreign countries having arranged to participate in it with imposing exhibits.

The exposition buildings are rising rapidly on a 60-acre tract on Long Beach harbor. The group will include about 50 structures, all of them in picturesque architecture based on Moorish designs and on the architecture of old Spain. The world show is to commemorate the coming of the Spanish padres to California to establish the missions for civilizing the Indians. Much attention will be given to landscaping the grounds about the palaces, pavilions and colonnades.

A Triple Wreck in Ohio

Two men were killed, two others were seriously injured and traffic on three railroads was tied up by a triple train wreck at a railroad crossing near Barberton, O., May 29.

The wrecks occurred during a dense fox when a Baltimore & Ohio freight train crashed into a westbound Pennsylvania freight. An east bound Pennsylvania then sideswiped the wreckage and was derailed.

—International Newsreel.

Suburban Electric Railway Yards, Melbourne, Australia, in the Heart of the City. The Government is to Put a Roof Over This Area and Erect Buildings Thereon. This Will Cost $2,000,000, But It Will Wipe Out the Railway Deficit and Establish a Sinking Fund.

Terminals and Air Right Values

Economies in Electrification

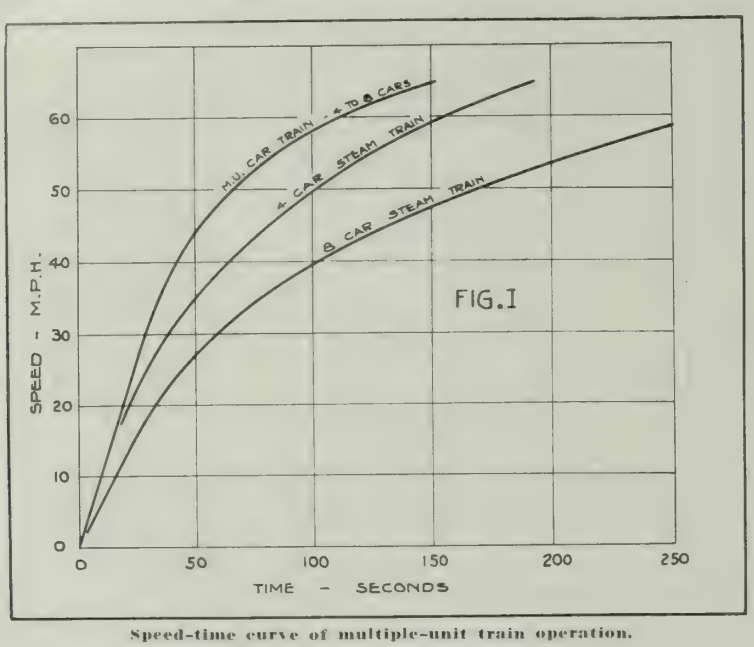
By H. A. Dahl

Westinghouse Elec. & Mfg. Co.

ONE OF the attractive features in connection with terminal electrification is the ability of electric trains to operate under ground, thereby opening up a wealth of possibilities in placing the passenger terminal in the most advantageous location from the standpoint of convenience to patrons. Obviously, subway construction is expensive, but there are times when it is justified, particularly when the air rights can be sold.

The Pennsylvania Railroad and New York Central properties in New York are outstanding examples of the possibilities of terminal electrification. Both terminals illustrate the value of the so-called air rights, and the Pennsylvania Railroad station in particular shows how trains and traffic can be brought into the heart of the metropolitan area by means of subways. The Pennsylvania terminal which is familiar to most of us, is joined to the west bank of the Hudson and to the east bank of East River by tunnels between these two points which do not reach the surface except at the station.

Another example showing how congestion can be relieved by electrification is a passenger terminal having considerable suburban traffic. Here the results are obtained chiefly due to the decreased number of train movements in the terminal and also to the quicker movement obtained with electric motive power. With locomotive operation and a stub-end terminal, the minium number of track movements per train-turn-around is six, whereas with motor car trains the minimum number is but two. If the train is to be broken up the number of movements in each case is increased but will be less under



Speed-time curve of multiple-unit train operation.

electric operation on account of the greater flexibility obtained in train make-up.

With motor car trains and a good track layout it is possible to make the track movements almost coincide with the train movements. This not only means less idle time for the cars in the terminal but an appreciable reduction in the congestion at the throat of the terminal because of the reduction in switching and track movements. In a stub end terminal such as the Pennsylvania Railroad, Broad street terminal at Philadelphia, where there are many through trains electrification of part of the suburban service with motor car trains makes it possible now to handle probably double the number of trains which formerly could be handled by steam. With complete electrification of the through trains also, the capacity will be still further increased.

Aside from the relief offered at the terminal, motor cars operated in place of steam trains in suburban service make it possible to offer a much higher grade of service which will considerably increase the volume of traffic. This is brought about not only by the faster schedules offered and the absence of soot and cinders, but by the more frequent service it is feasible to give.

The cost of equipment for electrification is determined by the peak traffic condition which for a passenger terminal electrification is of several hours duration in the morning and evening rush hours. It is evident then, that fixed charges are determined by the peak traffic whereas operating charges are largely a function of the train miles and car miles operated. However, there is one operating charge which is also controlled by peak traffic. This is the power cost which for a typical terminal electrification will be about 50 per cent for demand, measured during peak traffic and 50 per cent for energy based on the total kilowatt hours used. Since fixed charges are not increased by off-peak operation and the energy charge for off-peak operation is much less than the average energy charge it is evident that the additional cost of such operation is little more than crew expense. It is, therefore, profitable where electric operation is employed to give a fair amount of service throughout the day. Two and three car motor car trains may be operated frequently whereas steam trains of this length would be prohibitive on account of the expense.

The faster schedules possible with motor cars in suburban service are due to the more rapid acceleration. An accompanying curve shows the accelerations which can be obtained on a tangent level track with motor car trains and with the steam trains of four and eight cars. In this comparison the same car bodies and loads were assumed, and the motor car includes the weight of a suitable two-motor, single-phase electrical equipment and modern air brakes. The steam locomotive assumed has a total weight in working order of 200 tons with 180,000 lb. on the drivers and a maximum tractive force rating of 41,000 lb. These proportions are believed to be representative of locomotives now used in suburban service. The comparative data are based on a motor car loaded weight of 63 tons; a loaded weight of 50 tons for the cars hauled by the steam locomotive; a total weight of a four car steam train, including the locomotive, of 400 tons; and of a four car multiple unit train, 252 tons. The weight of an eight car steam train is 600 tons; and of an eight car multiple unit train, 504 tons.

The locomotive assumed has the necessary capacity to haul seven cars at approximately the same free running speed as can be made with the motor car trains on tangent level track. It is evident, therefore, that when operating in long-run service the steam locomotive hauling a seven car train can make approximately the same schedules as the motor car trains. In this connection it should be understood that the performance of motor car trains is substantially the same irrespective of the number of cars in the train.

Although approximately the same schedules can be made in long-haul service with either locomotive drawn trains or motor car trains, the difference is very marked in short-run service. The tabulation on the next page shows the schedules which can be made in short runs with the two types of motive power assumed.

In calculating the schedule

speeds shown, stops of 20 seconds, 25 seconds and 30 seconds were assumed for the 0.5 mile, 1.0 mile and 1.5 mile runs respectively, with a definite time added to the calculated minimum wheeling time for each run to give a reasonable speed margin.

With electric locomotive-drawn trains it is feasible, of course, to have a higher percentage of the total train weight carried on the locomotive drivers than can be done with steam locomotive and hence obtain a higher accelerating rate. The schedules which can be made in short-run service with properly designed electric locomotives are therefore, somewhat better than can be made with steam locomotives, but obviously the accelerations will be slower than with motor cars and the schedule speed also less.

Electrification of suburban traffic in most cases, will result in reduced cost of operation. The maintenance of equipment with either motor cars or electric locomotives will be less than with steam operation. On account of the higher schedules and quicker turnaround possible, the number of cars required will be less and for the same reason and also because the number of men per train crew can in some cases be reduced, the crew hours will be less. The cost of electric power supplied by a modern power system should be less than the cost of fuel.

A Multiple-unit Train On the Long Island Railroad. This Road Handles the Most Dense Suburban Passenger Traffic of Any Line in the World.

The general statement cannot be made that the reduction in operating expense by electrification of metropolitan passenger terminals will justify the expenditure for equipment required, for the volume of traffic which can be handled with existing steam operation. It should be borne in mind, however, that the electrification investment for this volume of traffic provides a tool which is available for handling a considerable increase in traffic with only a small additional investment for rolling stock and possibly substation service can also be utilized for ultimate electric operation of through trains and this should be considered in laying out the terminal installation.

Average length of run—miles	Schedule Speed—MPH. Steam Train		Motor Cars	
	4 cars	8 cars	4 cars	8 cars
0.5	16.5	14.8	17.9	17.9
1.0	22.9	20.8	24.8	24.8
1.5	27.7	24.8	29.5	29.5

A High-speed Electric Locomotive Used in Main Line Passenger Service Entering New York On the New Haven System.

Electrification, whether motivated by one cause or another, is a major improvement which can be readily expanded with the needs of the service. It is the eventual step in the case of a continually growing suburban traffic operated by steam. Its reliability has been well demonstrated by existing terminal electrifications. Its ability for putting traffic over the road is well demonstrated by the New York terminal electrifications where probably the heaviest suburban traffic in the world is brought into the heart of a large city.

Queer Happenings in May

THIS yarn came from Lexington, Ky., May 15. A. G. Bush, veteran engineer, had just started on his run from Hodgenville for Elizabethtown, 20 miles away, when he leaned out of his cab and sneezed and out bobbed his false teeth all over the right of way.

The train ran nearly a half mile before Bush could stop it and back to the scene of the disaster. Realizing he could not do without his "grinders," he forgot all about the passengers aboard and shattered all precedents of his road by attending strictly to his own selfish interests. You can't run a train without teeth.

They are a sympathetic people down there. Crew and passengers and ultimately some of the natives joined in the search for the missing teeth, but without avail. Bush, with passengers, mail and express to be served, but without his teeth, climbed into his cab and started again.

He continued to look backward, however, where a searching party was still active and before the train was out of sight he saw one of the searchers waving frantically to him, indicating that the lost teeth had been found. Brushing aside all schedule regulations, Engineer Bush took his train back to the spot a second time, recovering his lost teeth and lit out again for Elizabethtown where, according to the record he arrived late for the first time in several days.

Just a Boyish Prank

A schoolboy's prank, not a plot or sabotage conspiracy as suspected, wrecked the Reading Railroad's Atlantic City flyer, endangered the lives of 300 passengers, and burned the engineer and fireman painfully May 16, near Camden, N. J.

This was revealed when detectives, called by the boy's mother, questioned 10-year-old Vincent Burkett. Halting and on the point of tears, he told how he placed a spike on the rail and ran home in terror when he saw the spike wreck the speeding train.

"I always put pennies on the track and trains flattened them out," he said. "Last night we were going to a carnival with our express wagons and I found a spike.

"I thought the engine would flatten out the spike like a penny. I put it on the track and we watched. When the engine ran lopsided we got scared and ran home."

Nearly 100 passengers were bruised or shocked severely, 200 more were in danger of death. Fireman Reuben Samples, leaped clear as the engine toppled over. He rushed back to drag Engineer Peters, blinded and burned by steam, to safety. Both are recovering from painful burns.

Plane Delays a Train

Think of a conductor reporting his train delayed 20 minutes by airplane 960! Sounds crazy, but it happened a few days ago on the Los Angeles division of the Southern Pacific.

The delay was caused when an airplane, flying low across the tracks to make a landing near Ventura Junction, broke the signal wires strung along the railroad tracks.

Snapping of the wires caused the safety block signal to swing at stop, halting the northbound Shore Line limited.

The train was delayed 20 minutes while members of the crew investigated and found the broken wire. Superintendent Gaylord's report stated the train "on reaching Block Signal 3971 found same at stop and on flagging through found cause was due to airplane No. 960, which had struck signal wires in landing at point one-fourth mile east."

The plane made a landing without damage.

Boyhood's Happy Days

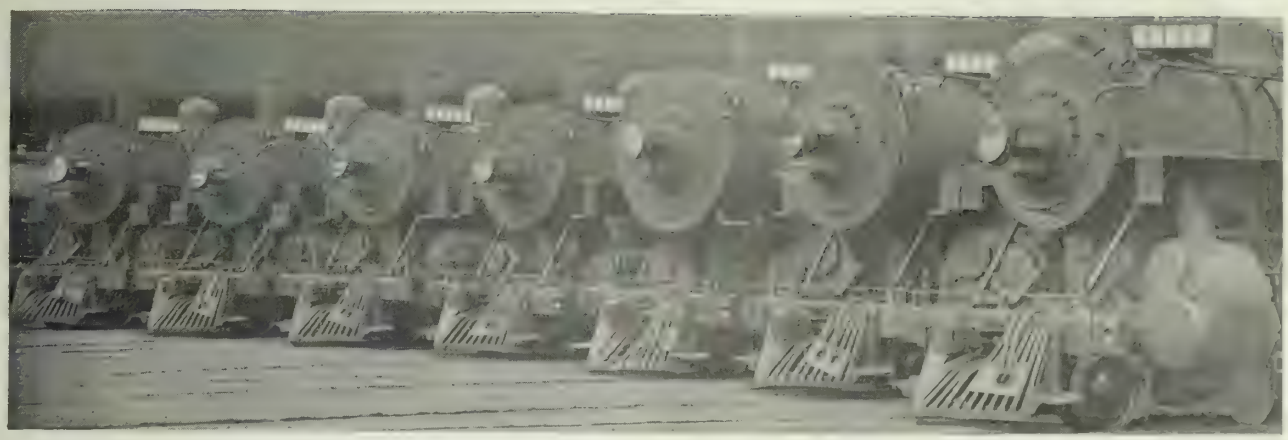
Ernest Thomas, 6, and Gilbert LeRocque, 7, both of Ashton Place, Lynn, Mass., were filled with a strange ambition one Sunday in May. They decided to go window smashing, but didn't stop at any mere store front or household glass. They found themselves a nice shiny Boston & Maine coach on a siding not far from a rock pile. Now the coach isn't shiny any longer. Of its 22 panes, all but two proved the accuracy of the aim of Ernest and Gilbert. The police arrived in time to save the rest of the car.

Here's a Speedy King

King Boris of Bulgaria broke all railroad speed records in the Balkans, May 19, when just outside Sofia, unknown to passengers, he took the throttle from the regular engineer of the Varda express and for some time ran the train at nearly 80 miles an hour, which is unprecedented for the slow-moving Balkans.

The passengers were mystified by the speed which toppled them from their seats. At the end of the journey they saw the driver was their king, whose face and hands were covered with soot.

"I was just trying out one of our new locomotives," said Boris modestly.



Cutting Down the Railway Fuel Bill

The Chicago Convention

By R. W. Henderson

AS MIGHT be expected, the subject about which delegates to the International Railway Fuel Association's convention at the Sherman hotel, Chicago, wished most to talk, to which they were particularly eager to listen, was fuel and devices or methods for conserving it. It will not be difficult, therefore, to understand the keen interest these delegates displayed in the concise figures and facts of Dr. J. H. Parmelee, director of the bureau of railway economics, on "Some Economic Aspects of Fuel Conservation;" K. F. Nystrom, superintendent, car department of the Milwaukee, on "Roller Bearings in Relation to Fuel Economy;" W. E. Woodard, vice president, Lima Locomotive Works, on "The Possibilities of Future Locomotive Design;" A. W. Bruce, designing engineer, American Locomotive Co., on "The Locomotive of Today and the Future As a Factor in Fuel Economy," and Lawford Fry, metallurgical engineer, Standard Steel Works Co., on "Combustion in Locomotive Boilers."

These were the things about which fuel supervisors and other railroad men wanted to hear, and about 2,100 of them gave exceptionally close attention to every meeting for that purpose. Of course the exhibits in the mezzanine attracted much attention. For a wonder, too, the weather was excellent except on one day when rain fell. The convention met Tuesday, May 8, and adjourned Friday afternoon, May 11, after holding eight sessions.

"The average number of pounds of locomotive fuel consumed in freight service in 1921," said Doctor Parmelee, "was 162 lbs. per 1,000 gross ton miles (including locomotive and tender.) With the exception of a slight rise in 1922, every year from 1921 to 1927 showed a reduction in fuel consumption, the number of pounds of fuel per 1,000 G. T. M. dropping steadily from a maximum of 163 pounds in 1922 to a minimum of 131 pounds in 1927. This was a reduction in five years of 32 pounds per 1,000 G. T. M., while the six years from 1921 to 1927 showed a net reduction of 31 pounds, or 19.1 per cent.

"The greatest reductions, both in amount and in percentage, occurred in 1924, when the average consumption declined 12 pounds under 1923, or 7.5 per cent.

"The year 1927 also made a very satisfactory showing in this respect. The average consumption, which stood at 137 pounds per 1,000 G. T. M. in 1926, fell to 131 pounds in 1927. This reduction of six pounds was equivalent to 4.4 per cent, which greatly exceeded the relative reduction of 1926, and slightly exceeded the average annual reduction of the previous five years.

"You will recall that President Aishton of the American Railway Association, in his address before the International Railway Fuel Association in 1924, made the striking statement that the saving of a pound of fuel per 1,000 gross ton miles was equivalent to saving 562,000 tons of fuel a year in the freight service alone, and represented a reduction of more than three million dollars in the total fuel bill of the roads. With this statement in mind, we can realize the importance of the work of the fuel men on the railways, in achieving a reduction in the single year 1927 of six pounds, and during the six years since 1921 a total reduction of thirty-one pounds per 1,000 G. T. M. Your reduction during the past year alone was six times as great as that saving of one pound for which Mr. Aishton pleaded so eloquently four years ago. On the basis of his estimates, this saving of six pounds was equivalent to an actual physical economy of more than three million tons

of fuel in 1927, and a saving in fuel costs upward of eighteen million dollars.

"Turning for a moment to the passenger service, we find, as in the case of the freight service, there was a slight increase of passenger service fuel consumption in 1922, while another small increase occurred in 1923. From that date down to 1927, there was a consistent reduction year by year. The net reduction during the six-year period from 1921 to 1927 amounted to 2.3 pounds of fuel per car mile, or 13.0 per cent. The reduction in 1927 alone was equivalent to 2.5 per cent, which was greater than during the next preceding year, and also slightly exceeded the average annual reduction of the previous five years.

"In this connection it is well to keep in mind that a ton is a fairly standard and uniform measure, while a car is not. When we refer to fuel consumption in the freight service per thousand ton-miles, we are using the same basic measure in the different years. When we speak of consumption in the passenger service per car-mile, however, we are utilizing a unit of measure—the passenger car—which may and does vary considerably in weight and character from year to year. This is indicated by the fact that the average gross weight per passenger car-mile increased from 64.8 tons in 1921 to 72.1 tons in 1927, or 11.3 per cent. Even between 1926 and 1927 the gross weight per passenger car-mile increased nearly one ton.

"This makes the fuel achievement in the passenger service much more striking than appears from the fuel statistics, and places it on a basis closely corresponding to the sterling accomplishment attained in the freight service.

"It will be recalled that fuel consumption in the freight service was reduced 19 per cent between 1921 and 1927. The apparent consumption in the passenger service declined 13 per cent, but when the increased weight of 11 per cent per car-mile is taken into account, the real reduction considerably exceeded 13 per cent.

"Thus the fuel consumption statistics for 1927 show record-breaking achievements in both the freight and passenger service, and mark another step forward in the long series of progressive improvements in the purchase, distribution, utilization, and conservation of railway locomotive fuel.

"Percentage reductions are important, of course, but I find it difficult to visualize what they mean. To get a clear picture of the record-breaking fuel performance of the railways in 1927, I do not depend wholly on the statement that it meant a reduction of so many percentage points, so many tons of coal, or so many millions of dollars.

"Referring again to Mr. Aishton's address of 1924, we all remember how vividly he emphasized the importance of a pound of coal, when he said:

"I don't know of anything better than to get right down to a little thing like a plain, ordinary lump of coal. I have in my hand a piece, it weighs just a pound. One pound of bituminous coal. It doesn't look like much. Most any of you would pick it up and throw it at a stray dog on the right of way.

"He then proceeded to translate the significance of that same pound of coal into terms of operating performance, and in simple yet striking words visualized the importance of a pound of coal when intelligently utilized in the process of firing locomotives.

"Let us try the same visualizing process with respect to the fuel performance achieved by the railways last year. On the average, in cold weather and hot, in rain and in snow, in sunshine and in fog, in daytime and during the dark, railroad freight engines were hauling a thousand tons of weight one mile for the expenditure of 131 pounds of fuel. This is equivalent to 131 thousandths of one pound of coal, or 2.1 ounces, per ton-mile. That is, the railways in 1927 hauled one ton of weight (2,000 pounds) a distance of one mile for each 2.1 ounces of fuel consumed. To paraphrase Mr. Aishton:

"Let us consider a plain, ordinary lump of coal. I have in my hand a piece, that weighs just two and one-tenth ounces. Two ounces of bituminous coal. It doesn't look like much. Any of you would pick it up and throw it at a stray cat or chicken on the right of way.

"Yet this piece of coal, gentlemen, measuring approximately 2 by 2 by 1½ inches, when harnessed with thousands more like it, and fused into a furious flame inside one of those tremendous modern power plants known as a steam locomotive, will do as much work in five minutes as a sturdy team of horses could scarcely accomplish, after much painful effort, within half an hour.

"Talk about mass production, and modern engineering, and the harnessing of natural forces! If any branch of industry can challenge this lump of coal as a measuse of progress along these lines, let it come forward and the railroads will go to the mat with the challenger. * * * *"

These officers were elected for the coming year:

President, T. C. Hudson, assistant general superintendent of motive power, Can. Natl. Rys.; vice presidents, C. H. Tyson, fuel agent, B & O; W. J. Tapp, fuel supervisor, D & R. G. W., and W. G. Black, assistant to the president, Erie Railroad.

Executive committee, J. E. Davenport, retiring president, New York Central, Weehawken, N. J.; J. W. Dodge, I. C. R. R.; J. D. Clark, C. & O. R. R.; C. I. Evans, M. K. T. Ry.; H. Morris, C. R. R. of N. J.; L. E. Dix, T. & P. Ry.; J. M. Nicholson, A. T. & S. F.; C. Roberts, Pennsylvania R. R.; C. T. Winkless, C. R. I. & P. Ry.; C. P Dampman, supr. fuel conservation, Reading Co.; R. S. Twogood, asst. engineer, Southern Pacific Co.

The Story of Power Brakes

Modern Train Operation

By L. K. Sillcox

Watertown, N. Y.

ONE never fails to associate Pittsburgh with George Westinghouse and his untiring life work in the development and manufacture, among other things, of power brakes for railways. In his farewell address as president of the society, Mr. Westinghouse explained that the idea of braking apparatus came to him in 1866, when a train operating between Schenectady and Troy, N. Y., on which he was a passenger, was delayed a couple of hours due to a collision between two freight trains. The loss of time and the inconvenience arising from the delay suggested that if the enginemen of those trains had had some means of applying brakes to all of the wheels of their trains, the accident in question might have been avoided.

So far as locomotive brakes are concerned, in 1833 Stephenson patented his steam brake in which steam pressure, acting on a movable piston, took the place of the hand-operated mechanism by which the force was applied through a system of rods and multiplying levers (and cams in this case) to the brake shoes. It will therefore be observed that there was a source of power for the brakes in conjunction with means whereby this power was made to act upon the brake rigging proper —a "brake" cylinder with movable piston—a foundation "brake" gear and a means for transmitting the force exerted, namely, the "brake" shoes.

Hand-operated car brakes with various forms of foundation brake gear met all the requirements for a considerable period, although a general realization existed that some form of continuous power brake was gradually becoming a necessity.

In 1853 the Creamer brake was brought into use. It consisted of a large spring attached to the brake staff and was wound up immediately after leaving a station. Attached to this mechanism was a cord which ran through the train to the locomotive cab. The brake was so designed that when the engineman pulled the cord the coil springs on each car were released. These at once wound up the chains leading to the foundation brake gear, in consequence of which the brake shoes were brought against the wheels.

Two years later (1855) the Loughridge chain brake came into use. It was formed of a system of rods and chains continuously connected throughout the train. Each car was fitted with two pairs of small pulleys sliding toward each other upon an iron framework, but held in release position by a spring. A top connection rod was fastened to each pair of pulleys and formed a communication with the foundation brake gear. The locomotive was fitted with a drum in conjunction with a worm and gear and a small friction wheel, the latter being actuated by a lever conveniently located in the cab for use while running. This hand lever was used to bring the friction wheel in contact with the bearing face of one of the driving wheel tires, thereby causing the drum to wind up the chain and shorten its length throughout the train, thus applying the brakes on each car connected throughout.

The first pneumatic brake was of a vacuum type patented by James and Charles Nasmyth in 1844. In 1848 Samuel C. Lister patented an air brake having an axle-driven pump, reservoir, and cylinder, with pipe and connections on the various cars, thus constituting a straight-air-brake equipment much the same as that brought out in 1869. It was operated by the train crew in the caboose and not by the engineman.

Later attempts resulted in devising a brake connected by levers to the draft rigging, but this scheme, not being workable, was soon abandoned. Following this an inventor named Ambler developed a chain brake operated by revolving a windlass in the engine, the chain thus being taken up and the brake levers on each car made to operate. Mr. Westinghouse discovered the idea of exchanging the windlass for a cylinder beneath the locomotive, the piston of which was formed to connect with the chain so that the drawing in of the piston by the application of steam from the locomotive would give a more accurate control of the brakes than was possible with the windlass device. Because of the excessive piston travel necessary on trains having more than four or five cars, the system was changed to one having a cylinder beneath each car with a flexible pipe connecting each one to the locomotive for its supply of steam. It was impossible to transmit the steam properly, even in favorable weather, and consequently the plan was given up.

Mr. Westinghouse next turned his attention to the work being done with compressed air in driving tunnels where connected piping as long as 3000 ft. was employ-

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Mr. Sillcox is assistant to the president of the New York Air Brake Co., member of the A.S.M.E. Contributed by railroad division for presentation at the spring meeting at Pittsburgh, Pa., May 14 to 17; a condensation of a very fine historical resume of airbrake development, etc.

ed. He discovered that this would suffice for any length of train, and thereupon began actively to develop designs of apparatus suitable for the purpose, filing his first patent application in 1867, and having his first patent on April 13, 1869. Work on the sample equipment for demonstration purposes, consisting of an air pump, a main locomotive reservoir, and four car cylinders, was started at the same time in a machine shop in Pittsburgh, and this apparatus was finally completed in the summer of 1868, almost 40 years after the development of the first locomotive.

So that a service test might be carried out, the Pennsylvania Railroad gave Mr. Westinghouse permission to fit up the Steubenville accommodation train, which consisted of a locomotive and four cars. The Westinghouse Air Brake Co. was organized in July, 1869, and the Pennsylvania Railroad was the first to adopt (1869) the system of continuous brakes which, in its developed form, has become a standard necessity for present-day operation, not only in the United States, Canada, and Mexico, but throughout the world. In 1879 there were 3000 locomotives and nearly 10,000 cars fitted with Westinghouse brakes. From 1869 to 1872 straight-air brakes were employed. In 1872 the automatic air brake followed.

In 1885 the Master Car Builders' Association appointed a committee to report upon the feasibility of the application of power brakes to freight trains, and that body arranged what are now known as the Burlington (Iowa) brake trials made during 1886 and 1887. Two trains of 50 cars each were used, one fitted with the Eames vacuum brake and the other operated with compressed-air brakes devised by Mr. Westinghouse and later known as the quick-action automatic air brake. The immediate result of these tests proved the importance of prompt serial action and rapid application of the brakes on the rear cars of the train, if the effect of very serious and destructive shocks was always to be avoided.

The Westinghouse-Galton experiments, carried on in England in 1878, first demonstrated that, while the adhesion between the wheel and the rail—which causes the wheels to continue rotating—was practically uniform at different speeds, the friction between the brake shoe and the wheel—which resists the rotation of the wheel, and thereby stops the train—was considerably less when the wheels were revolving rapidly then when they rotated slowly. It was thereby demonstrated not only that a greater pressure could be safely applied to the wheels by the brake shoes at high speeds, but also that such considerably high brake-shoe pressures must of necessity be applied to the wheels at high speeds in order to resist the motion of the train as effectively as with the more moderate brake-shoe pressures at low speeds. During the progress of the experiments in England, special apparatus, of a somewhat delicate character, was employed with the existing type of standard automatic brake to regulate a variable pressure of the brake shoes upon the wheels—beginning with a severe pressure at high speeds and reducing to a moderate pressure when the speed became low—whereby much shorter train stops were secured than had ever been previously attained in any other way. No practical application of this method of operation was made in regular service, the reasons being (1) that the conditions of regular train service at that time were not such as to necessitate the utilization of this principle and its added complication; (2) the apparatus was of a somewhat delicate and complicated nature, making it inconsistent with the exacting element of complete reliability which, of necessity, is a basic requirement for any power-brake apparatus.

With the development of the quick-action brake in 1887, the presence of the emergency brake, in addition to the ordinary automatic brake for service use, prepared the way to an entirely practical application of the principle previously discovered in England, by means of simple and reliable devices. Just previous to this the Master Car Builders' Association took intelligent and appropriate steps compelling the railroads to improve the foundation-brake-gear equipment, with the result that the stronger structures provided were found to be sufficiently adequate at that time for such increased duty as was imposed upon them in producing the increased brake-shoe pressures which were utilized at high speeds by the high-speed brake brought out in October, 1894.

The apparatus of the high-speed brake was simple and consisted of the old standard quick-action air-brake mechanism, as ordinarily applied to passenger cars and locomotives, to which was added only an automatic reducing valve. This automatic pressure-reducing valve was so constructed that it remained inoperative in all service applications of the brake, unless, at any time, the brake-cylinder pressure became greater than 60 lb. per sq. in. (for which the automatic pressure-reducing valve was normally adjusted), in which case the reducing valve operated promptly to discharge from the brake cylinder as much air as was necessary to restrict the brake-cylinder pressure to 60 lb. It was thus possible to maintain a maximum brake-cylinder pressure of 60 lb. in all service applications of the brakes, regardless of the air pressure regularly carried in the brake pipe and auxiliary reservoirs.

In an emergency application of the brakes the violent admission of a large volume of air to the brake cylinder (made possible by the quick-action features of locally venting the brake pipe) raised the pressure more rapidly than it could be discharged through the service valve, and the port thereby became partly closed, thus restricting the discharge of air from the brake cylinder in such a manner that the pressure in the brake cylinder did

not become reduced to 60 lb. until the speed of the train had been materially decreased.

In order to cause the automatic reducing valve to become practically effective for producing the increased braking efficiency, the pressure of the air carried in the brake pipe and auxiliary reservoirs was increased from 70 (the normal standard) to 110 lb. per sq. in. With this pressure in the brake and auxiliary reservoirs, an emergency application of the brakes almost instantly filled the brake cylinder with air at approximately 85 lb. pressure, thereby increasing the braking power from about 90 per cent of the light weight of the car (the usual standard) to about 125 per cent, and the applied pressure of the brake shoes upon the wheels increased 42 per cent at that instant. The air pressure immediately began to escape from each brake cylinder through the automatic reducing valve, and continued to do so until the brake-cylinder pressure became 60 lb., which was thereafter retained until the brakes were released by the engineman. Due to the high pressure normally carried in the auxiliary reservoirs (110 lb.), a full-service application of the brakes (charging the brake cylinders with air at 60 lb.) might be made and still leave the pressure in the auxiliary reservoirs at almost 86 lb. If, after releasing the brakes a second application of the brakes was demanded before there had been time to recharge the reservoirs, there remained an abundance of air stored in the reservoirs to make an emergency stop shorter than that of the ordinary quick-action brake when charged at 75 lb. pressure. These advantages, coupled with such a restricted brake-cylinder pressure for all service applications of the brake that wheel sliding was almost entirely avoided, required no further demonstration to insure recognition of their necessity upon important trains. By simple additions to the brake apparatus on the locomotive, the brake-pipe pressure was easily and quickly changed to 70 lb. when the locomotive was used in other classes of service.

In order more fully to appreciate the various advantages of improved brake apparatus upon trains running at high average rates of speed, it is necessary to keep in view the special circumstances under which such trains are operated. While ordinary local and secondary trains are frequently called upon to run at very high speeds where it is conveniently possible and for relatively short distances, this is accomplished under circumstances which involve no unusual risks. The chief characteristic of limited trains and also those operating in dense traffic territory is not so much the maximum speed attained as its high average rate between terminals. This necessitates a velocity through yards, at intersections, over switches and crossovers not demanded in any other service and consequently not provided for. Signals are generally located at distances from the points to be protected that will give ample space in which to bring trains and prevent an unnecessary speeds, but they need to be sufficiently near to avoid interference with the orderly movement of trains and prevent an unnecessary retarding of their progress at remote distances. Because of this, the spacing of train-signaling apparatus on roads subject to dense traffic has therefore been established upon these principles. The introduction of a train service in which the average speed is considerably greater than that for which the operating conditions of the railroad have been established is accompanied by complications of greater moment than may be readily anticipated.

From a study of the fundamental physical laws governing the distance in which a train can be stopped from various speeds, we observe that at 40 miles an hour the distance required is 1.8 times as great as that in which it can be stopped from a speed of 30 miles an hour. At 50 miles an hour, the stopping distance is 2.8 times as great as that necessary for 30 miles an hour, and 1.6 times as great as that required at 40 miles an hour. At 60 miles an hour, the distance required for stopping is four times as great as that required for 30 miles an hour. In addition, the number of times train-signal indications must be observed and also the possible relative frequency with which brake applications may be called into action increases directly with the speed.

The objections to materially complicating agencies other than the air brake for the purpose of protecting fast trains have always been sustained and much attention, study, and effort have therefore been constantly directed to this feature with the result that brake designs and apparatus are available to the railways in advance of traffic demands. Almost every attempt to provide improved power-brake mechanism has developed the fact that the foundation brake gear, levers, rods, brake beams, etc., which are in service are usually not sufficiently strong to withstand the sudden strains to which they are subjected in emergency applications of the latest types of brakes.

With the widespread use of modern steel passenger cars in steam railroad service, the brake force required to obtain the same effectiveness as was obtainable with the apparatus used in lighter cars became so great as to exceed the capacity of a single brake cylinder and the greatest allowable multiplication of its power by leverage. The constantly increasing speed and weights of trains and the economy of time necessary for the greatest operating efficiency under competitive traffic demands, with the increase in length of trains and the greater volume of air which must be handled through the brake pipe, imposed conditions which made the ordinary service functions and automatic safety and protective features of the brake apparatus hardly secondary to the compelling need of a high maximum emergency stopping power to insure the safety of passengers and

equipment. Studies of the various phases of the general problem involved such conditions as (a) decreased coefficient of brake-shoe friction due to greater applied shoe pressure and speeds; (b) possible breaking down of the brake shoe under the severe conditions imposed; (c) increased brake leverage ratio, with consequent increased piston travel and lower maximum brake cylinder pressure; (d) increased foundation-brake-rigging deflection and false motion, where clasp brakes were not employed, due to severe stresses in the members, location of applied shoe pressure with respect to the wheel, and other causes, tending to create false (increased) piston travel, increasing the time to obtain brake effectiveness on account of the larger cylinder volumes occasioned in this way, and causing an unnecessary drain on the air supply when releasing and recharging; (e) amount of unbraked locomotive weight; (f) increased train momentum; and (g) greater frequency and density in train movement.

Trains scheduled to run at high speeds are necessarily limited in respect to their weight and length, while powerful motive power is required to haul them. It thus occurs that the weight carried to the rails by the engine truck and trailer truck of a locomotive may be equal to seven per cent of the weight of the whole train (locomotive and cars combined). Failure to provide means for braking any wheels in a train detracts from the stopping efficiency of the brakes and this must ever remain first consideration in high-speed service.

Water Competition Increases

The first water-rail bulk freight terminal, the transfer between the lake boats, the Illinois-Mississippi River barges, and the railroads, was placed in service last month at East Chicago by the National Terminals Corpn.

This modern water terminal is at the forks of the Indiana Harbor canal, three-quarters of a mile from Lake Michigan, on 22 feet of water. The southern branch of the canal, 12 feet deep, leads to the Calumet River a mile and a half away, and the west branch of the canal, 22 feet deep, runs to the 1,300 acre site of the Jones & Laughlin Steel Co. The terminal company operates in Cleveland, Indianapolis, and the North Pier warehouse in Chicago, and is arranging to establish terminals in Toledo, Duluth, Milwaukee, and Buffalo.

In the East Chicago terminal it has already invested $75,000 and has completed financing for spending a total of $2,000,000. It is served by the Indiana Harbor Belt; Elgin, Joliet & Eastern; Pennsylvania, and Baltimore & Ohio Chicago Terminal railroads. W. W. Huggett, vice president and general manager of the private terminal says his terminal is ready with two Gantry electric cranes and two locomotive cranes to unload boats at a rate of 150 to 300 tons an hour.

"The first boatload from Buffalo is reinforcing bars for Milwaukee," said Mr. Huggett. "The boat with its load will steam past Milwaukee, come to Chicago and unload, and $1 a ton will be paid to haul the bars back to Milwaukee, but the shipper will save money by the arrangement.

"We have assembled a boat load of rails for this first boat to take to Port William on Lake Superior, from which it probably will take a boat load of grain back to Buffalo. The second boat will bring structural steel for Chicago and beyond. The shippers figure on saving about $1 a ton. We plan to have three boats of about 3,000 tons capacity each plying all season between Chicago and Buffalo. We are ready for the lake to the gulf waterway when it opens in 1929. Just across the canal from our terminal is the dock of the Standard Oil Co. and a little farther lakeward is the Inland Steel and the Youngstown Steel and Tube Co., the Roxana Oil and the Sinclair Oil Co., all with boats now operating.

"There should be a lot of business on the drainage canal and Calumet rivers when the lakes to the gulf waterway is opened, if one goes after it."

A Trailer and Two Deaths

The engineer and fireman of Monon train No. 36, en route from Indianapolis to Chicago, were killed May 25, when the train struck the trailer of a milk truck at St. Johns, five miles from Dyer, Ind., overturning the engine and derailing five coaches. William Bellengar, the engineer, was pinned under his engine, and Floyd E. Crowder, the fireman was scalded to death.

Encourage Your Employes

The value of a good idea does not depend upon its place of birth. If it is worth anything its employment is urged by the highest wisdom. Attention to the ideas of the lowliest worker may be followed by immensely valuable results. The idea of respecting the humblest employe and giving him encouragement and attention when he makes a suggestion, even though it may seem trivial, is a fine one. Far-reaching results are likely to accompany or follow such a policy.—Altoona (Pa.) Mirror.

Education Is Important

The educational campaign has been of much importance. The railway companies have constantly kept safety before the eyes of the passengers. Continued hammering in the end certainly gets results. There is nothing like being constantly at it.—Wilmington (Del.) News.

About the safest place on earth is in a railroad car. Certainly it is far and away safer than a seat in an automobile, or the path of the pedestrian. — From the Newark (N. J.) Star-Eagle.

Editorial Comment

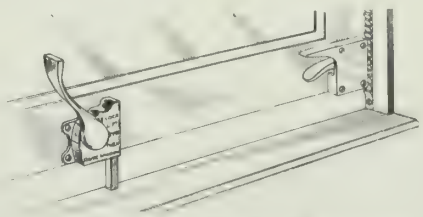
Speeding Up Yard Terminals

AT ONE of the recent meetings of the Western Railway Club in Chicago the subject of modernizing railway yards and terminals in order to speed up operations was considered so important that the entire evening was given to the question. It is now recognized that one of the best ways to increase the capacity of railroads is to reduce the time lost at engine terminals and in classification yards. It was suggested in this meeting that a committee be appointed to study the question of yards and terminals, old and new, and that the data obtained be made available to the railroads to assist them in developing a program of terminal improvements as fast as conditions warrant and as funds become available.

While the new yards and shops of the Texas & Pacific at Fort Worth are not large they are so complete, and have so many improvements not generally familiar to railroad men that it is quite within reason to say they may serve as an admirable model for study. A personal inspection of these yards and facilities within the last ten days, accompanied by several engineers of national repute, justifies this magazine in recommending them to the attention of any committee.

This Is Public Relations

It is altogether probable that much of the present burden of restrictive legislation under which railroads operate, much of the old antipathy toward their rates and other things might never have come into existence if the car windows hadn't stuck. A man starts for Washington or his state capital to testify in a rate case. Up to the time he buys his Pullman ticket and begins to talk of the surcharge, without knowing anything about it except the prices he is disposed to be fair. After a good dinner on the train he even forgets about the surcharge and once more is a rational human being, determined to present his case to the commission truthfully, and not to make any unnecessary fuss about it.



An Agent of Better Public Relations.

Then he tries to open the car window. Immediately the man seems to lose all control of himself. Everything changes, including his language, his attitude toward railroads, government ownership, prohibition, and other things. He tugs at the thing manfully, he struggles, perspires, ruins his collar and his cuffs, breaks his watch chain, looks about for the porter who, of course, is somewhere else—luckily—and sinks into his plush-upholstered seat defeated. His views on railroad rates are, by this time, unfit for publication because of certain laws in such cases made and provided. He determines to divert all his shipments to another line, and then decides that perhaps the other is no better, and for all he knows may be worse.

But from this time forward we may expect a vast improvement. A change is coming. A man has invented, and moreover a Class 1 road, the New Haven, is adopting a little jack, a simple thing it seems to be, with which a child can open a car window without a bad word.

Regardless of the advertising department we believe it a public duty to tell the world about this jack. Notice the little plunger protruding from the bottom of the gadget on the window? See the small handle above it? This little plunger saves tempers and eventually may relieve the railroads from all regulation. A letter from a friend on the New Haven assures us solemnly that with only a slight pressure of the thumb the handle forces the plunger down, develops a leverage equal to a hundred pounds, and then forces the nastiest window up so that the cinders and smoke and dust may enter and circulate freely through the passenger's hair. There are other intricate details about this invention, but the main feature has been disclosed: It will open a car window, and for this one glorious reason should prove a boon to the world.

The Gentleman From Iowa Rises

Senator Brookhart of Iowa, in the last days of congress, introduced again, and doubtless will continue to introduce from time to time, his bill authorizing the Interstate Commerce Commission to acquire a coast-to-coast railroad system, his idea of government ownership in experimental stages. The proposed line would be composed of enough common carriers to make a complete system from the Atlantic to the Pacific Coast, including rail and water carriers. The road would be operated by a federal corporation.

Doubtless Senator Brookhart's ideal railroad would have army officers in charge, as in the case of the Mississippi-Warrior River barge lines. Doubtless, also, it would soon begin to show the same kind of net profits. If you can use government money, which is taken from the people, and make rates to suit yourself, as the barge lines do, you might be able to make a fairly good showing. It would be interesting to see a list of the men or organizations behind this scheme, for of course Mr. Brookhart never originated it.

Air and Rail Travel

The transcontinental air and rail service announced by the Pennsylvania Railroad and the Santa Fe and Transcontinental Transport, Inc., is a serious, business-like undertaking in transportation—not a stunt. For those who can afford it such traveling should be especially pleasant, relieved of the tedium of long days and nights in coaches or sleepers, and at the same time free from excessively long periods in the air which, for the novice at least, are something of a strain. For the beginner in air flights an hour or two usually is enough. Nothing but an emergency will induce a business man to stay up there for twenty hours. After a few trips, however, the strain on the stomach passes or is no longer felt, and the hands cease to grip everything as if it were gold and diamonds. The people of European countries fly about here and there quite casually nowdays. Americans will be doing it soon. At present however, no one feels brave enough to forecast the fate of this great venture. The thing to commend it to the public is the fact that its promoters are responsible men of national standing, and the further pleasant assurance that no stock is for sale.

When Lindy Was Lost and Why

The gallant and indefatigable Lindbergh, completing a transcontinental flight, arrived over Los Angeles a few nights ago about 2 o'clock in the morning. At that hour and in the merry month of May in this region fogs may be depended upon, but not the lights. Owners of private airports, not expecting visitors at night, had wound the clock, put out the cat, and gone home. When Lindbergh arrived over the city not a thing was to be seen through the fog except a flare from the lights of the streets. The city hall beacon could not be picked out of the general illumination. Not a thing could be detected to guide an aviator to a port of safety. Lindy might just as well have been out over the Pacific. He was lost. For more than two hours the young man flew here and there in the clouds seeking something that resembled a landing place. Finally he picked up the big beacon of the Standard Oil Co., at Montebello, and supposing it indicated an airport he swooped down in that direction, and discovered his error just in time to avert a crash. About 4 o'clock he found himself over Long Beach and there someone heard his motor, turned on the lights at the airport, and Lindy landed safely.

If the authorities of Los Angeles had asked the people to vote bonds for a half million or even a million instead of for six million the city might have started work immediately, last month, on a municipal airport. Six million frightened the people. Down in Dallas, Texas, the people willingly voted $400,000 for this purpose and at the same time voted $22,000,000 more for highways, schools and other purposes. Houston also has a fine airport, licensed by the government, properly lighted and equipped. More than a hundred planes were seen on its grounds one day recently. Dallas and Houston, combined, have about 600,000 population. Los Angeles has 1,200,000.

Something More Than Talk

In a paper which he read before the safety section of the A. R. A., at Buffalo, May 15-17, Herman H. Larson, Union Pacific trainmaster, said it had been 1015 days since since the last reportable injury to an employe in the Council Bluffs yards. Mr. Larson attributes this very largely to better training of the men in the details of safe operation by pictures, statistics, meetings and personal talks.

But this trainmaster from the West points out also that education alone, or just talking safety, does not accomplish the desired result. Clean yards, scrap material removed promptly, coal and rubbish taken out of the way—all these things have their part in preventing accidents.

The subject of close clearances is made a special subject by the rules examiner on the Union Pacific, and many such close clearances have been corrected, and the men have been educated by bulletins, time tables and talks into knowing where over-size structures and other protruding danger points are to be found and avoided.

Judge Sanborn Passes

The railroads lost a fair and impartial friend in the death May 10, at St. Paul, of Judge Walter Sanborn of the United States Circut Court of Appeals. Judge Sanborn was 82 years old and had served on the bench for 36 years. His personal work included the administration under receivership or reorganization of the Northern Pacific, Union Pacific, Chicago Great Western, St. Louis & San Francisco and the Missouri, Kansas & Texas railroads.

The Popular Ham and—

You can't get way from the old, popular, trustworthy dishes of home. Indeed you don't try, unless you have an especially elastic expense account and no regard for your interior decorations. Ham and eggs, says Paul Reiss, the smiling supervising chef of the Southern Pacific Co., still leads as America's most popular breakfast dish, and Paul bears out his statement by reporting that in 1927 the travelers on that company's trains and ferryboats consumed 384,751 platters of the delectable offering.

"Fine ham," Reiss said, "is always fine ham; but an egg that was fine two weeks ago has become too much of a veteran for dining car needs. In keeping with the company's reputation for speedy transportation, the dining car egg must be scheduled to reach the consumer not more than 24 hours after the hen has performed her duty."

Ham and eggs, toast and coffee for breakfast give you courage for the duties of the day. Then, at luncheon, a plate or two of corned beef and cabbage with rye bread and things. Even a railway supply salesman should feel cheerful with such fare.

Sam Cowan Is Still At It

Sam Cowan, attorney for the Texas Cattle Raisers' Association, told the Interstate Commerce Commission at Chicago, May 15, that his clients pay nearly three times as high a freight rate to railroads as the coal shippers pay. Because of this and contributing factors, Mr. Cowan said, equalization of profits on various commodities shipped by railroad is impossible. What Mr. Cowan overlooks is the fact that cattle shipments require several times as much attention as coal which does not have to be taken off the cars every 26 hours and fed and watered. Then too, if coal is dumped on the ground in a wreck most of it can be shoveled back into the cars without any great loss whereas, when cattle are scattered over the right of way that ends the matter except for the nearby farmers and the claim department.

Every railroad attorney in the cattle country knows Sam Cowan. He is the delightful gentleman who takes pleasure, during a rate hearing, in calmly asking the commission to require the railroad respondents to show precisely what was the average price of corn or leather on the third day after the surrender at Appomattox, or some equally diverting information which he believes the roads may have trouble in finding. Still, he has his place in the make-up of society. As President Gorman of the Rock Island once said, when all these things are settled a lot of men will be out of jobs, which may give the attorneys some comfort.

Every Day'll Be Sunday By-and-By

The Interstate Commerce Commission which seems to exist for about every purpose imaginable except to obey the provisions of the Transportation Act, has just issued an order directing railroads in northern states to install cab curtains for protection of enginemen during winter months. The commission also ordered that unnecessary or excessive openings about locomotive cabs be closed and that steam locomotives used in road service have a suitable window attached to the side cab window.

The Brotherhood of Railroad Trainmen has adopted a resolution favoring a six-hour working day on all railroads in the United States. In England the labor unions want a four-hour day. In that country everyone, in practically all callings, has to have a dish of tea and some biscuits in mid-afternoon. Perhaps this fact has not reached here yet.

The Editorial of This Edition

Away in the early morning,
Prepared for a long day's run;
The Iron Horse is ready,
Its history just begun.

THE history of the Iron Horse, so marvelously portrayed in the Baltimore & Ohio Centennial, last October, gave many a thrill to those well enough endowed by Nature to value such developments. It gave one a feeling of pride to be identified with an industry in which so many important things had taken place in a century: progress exemplified in the little Tom Thumb, the York, and the William Galloway. Who could fail to be impressed in looking at the old Atlantic, remembering that beginning in 1832, it served the Baltimore & Ohio faithfully for more than 60 years?

This was the romantic appeal, and romance, we like to believe, is not dead. Of course it isn't but the time has come in railroading when romance must be tempered with efficiency. Our old friend, Net Return, a vanishing, shrinking gentleman, needs a tonic. Spring is here, the months in which our grandmothers used to get out the sulphur and molasses, disagreeable stuff to take, but an effective remedy as most of us know. The sulphur and molasses of industrial life are found in truths, cold facts not pleasant to hear, brought to our attention, usually just when some of us imagine we are doing very wonderfully and need no medicine of any kind.

There were exactly 60,845 locomotives in the service of Class 1 roads December 31, 1927. What were they? Forty-nine and four-tenths per cent of them, that is 30,057, had been in service more than 20 years, most of them, at least 32 per cent, 19,470, trying to break the record of the Atlantic of hallowed memory.

Can you imagine it? Of course you can because you see them every day if you travel. You see them creeping along bravely over the branches, in switching service where they eat up coal as nothing else can do it; and occasionally you meet them even on the main line wasting fuel, raising the costs of maintenance.

But what of the other 50.6 per cent or 30,788? Many of them are not much better fitted than the others for the work they do. Nineteen and one-half per cent or 11,865 are from 15 to 20 years old, 13.1 per cent or 7,971, are from 10 to 15 years old; 8.6 per cent or 5,233 are five to ten years old, and only 9.4 per cent or 5,719 have been in service less than five years!

In a paper presented at the recent convention of the International Railway Fuel Association in Chicago, Mr. Bruce discussed the revenue-producing value, and the life of the average freight locomotive.

While allowing 25 years as the average life, he pointed out that improvement in motive power design as experience has shown limits the maximum productive period to ten years. The service during the following five-year periods reduces itself automatically as far as gross revenue is concerned 25 per cent in each period. From these facts Mr. Bruce concludes that about 50 per cent of the work done by the locomotive during its life is accomplished in the first third of its existence, and that probably two-thirds of its total net revenue return is made during this time.

Ordinarily this magazine doesn't print statistics for filing purposes, but there are moments when figures are needed for emphasis. This is one of them. How else can one discuss such grim realities as the fuel bill? Fuel cost the Class 1 railroads about 600 million dollars in 1927, and 88.6 per cent of this was for locomotives. In some operations new locomotives have shown as high a fuel saving as 32.7 per cent over their predecessors, and the predecessors weren't 20 years old, either.

That isn't the only saving made by modern power however; it hauls greater loads, reduces running time, makes possible longer locomotive runs, cuts the overtime charge for train crews, lowers the average cost of maintenance, and last but not least, it gives a better and quicker service to shippers.

In the annual report issued recently by one of the large freight carriers this statement was made:

> Many inefficient locomotives were retired last year and the number of types in use materially reduced. This meant savings in fuel and upkeep. At the same time the reduction in the number of types of locomotives resulted in time and labor savings in repair shops. To replace the discarded equipment locomotives were installed that cut fuel costs at the rate of $2,000,000 annually. There were also savings in labor costs.

But here's a remedy. In these high pressure days when a large part of the productive time of many railroad men is taken up in writing reports and producing figures about everything on earth of no value to anyone except politicians, and stock market gamblers, when the main duties of a railroad president seems to be to carry down a new report every day about something or other to the powers that be in Wall street, why not have a steam locomotive survey on your road?

We don't mean merely a count of the smoke stacks, figuring out how many are in the lead; we mean a real survey.

How many of your engines are qualified for the work to which they are assigned? What can they do? Are they economical to operate, to maintain? How many of that 49.4 per cent should be scrapped?

Suppose we call in the locomotive builders and get their reports. These men will study your operating conditions and tell you in an intelligent way what can be accomplished economically.

Let's take the in-between engines, the ones you can't quite afford to write off, and call in the stoker, the superheater and the booster men, and see whether they can't show you how to make them more efficient, and whether the investment will pay. Maybe a few stokers will reduce the loss in combustible fuel, a few boosters increase the tonnage rating, and so on. In other words let's make it a complete survey, the kind you would make respecting costs of equipment and operating results if you were making a study of electrification. Then establish a definite program regarding the development of your power according to resources available. Something more than the usual half-baked justification report you order prepared when you are going before the board with a request for an appropriation. Never mind figures about the crop conditions, the future traffic possibilities, etc. Look over the past and the present this time, and your motive power will be in better condition to take care of the future.

When you consider the cost remember the real function of the locomotive is to produce the power to move a train; therefore you are more concerned with the power output of the locomotive than with any other feature of it. Why not establish the value of the locomotive based on the drawbar horsepower?

Using this figure as a correct measure, it is logical to consider the purchase price of locomotives from the same angle. Applying this measure we find that instead of mounting in the last seven years as the costs of nearly everything has done the first cost of the locomotive actually has gone down about 19 per cent. Taking figures based on dynamometer car data developed on one road, and considering that all the engines are equipped the same way and based on present day prices of material and labor the price per drawbar horsepower of engines designed in 1921 is $34.40; in 1922 $31.70; and in 1925 $27.80. In other words during these few years locomotive design advanced so rapidly, and the power developed by the new type of engines was so much greater that in spite of the fact that the unit price advanced the actual cost per horsepower decreased.

In addition to this it is interesting to note that tests of the same locomotives also show a large increase in the gross ton miles hauled per hour for the same amount of fuel consumed. The engine constructed in 1925 showed an increase of 55 per cent over the one in use in 1921 over the same district, and 26 per cent over the one built in 1922. Next time you figure locomotive costs why not try this measuring stick?

I am not bound to win, but I am bound to be true. I am not bound to succeed, but I am bound to live up to what light I have. I must stand with anybody that stands right; stand with him while he is right, and part with him when he goes wrong.—Abraham Lincoln.

How Buses and Railroads Dovetail

—Ewing Galloway Photo.

The Bus Has Proved Its Value Even in Far Away Morocco, Algeria and Tunisia, Displacing the Old Faithful Camel on Hard-Surface Roads Built There by the French.

By Edward Dana

Gen. Mgr., Boston Elevated Ry.

IN taking more than a million people where they want to go, the Boston Elevated Railway operates rapid transit trains, electric street cars and gasoline motor buses.

Motor transportation these days is a big factor in the proper functioning of electric railway transportation. Motor trucks serve the Boston Elevated Railway, for example, as wreckers, tower wagons, maintenance and construction units, all to the end of taking people where they want to go most efficiently, and with the least possible interruption of service to the riding public.

Motor trucks with lifting jacks serve the useful purpose of keeping the tracks clear. They help restore derailed cars to service and remove stalled automobiles or other obstructions blocking the tracks. Trucks equipped with towers are on duty 24 hours a day, repairing trolley wires. Several trucks are equipped with chain hoists for loading and transporting welding and grinding machines from job to job. Power-dumping 2-ton trucks haul sand, gravel and ashes, and serve generally as utility units. Three-quarter ton trucks are utilized to collect money from scattered stations and to carry the paymasters from place to place. Another fleet of ¾-ton trucks serve as stock cars to transport equipment and tools. One truck works 24 hours a day testing cables and wires all over the Boston Elevated system. Two 3½-ton trucks are equipped with reel appliances to pull cables through conduits.

From this enumeration of duties performed, the absolute importance of motor trucks in the providing of public transportation by electric railways is apparent. The emergencies in this business, the times when difficult tasks must be accomplished quickly, regardless of obstacles, are best insured against by the installation of motor trucks of known ability in performance. Economy in operating costs is also to be considered in making a selection of the particular kind of motor truck to operate. The services motor trucks render electric railways, it appears from what has been written, are pretty much back stage. The motor buses, however, are out in the public eye, carrying passengers, along with the rail cars.

The Boston Elevated Railway began the operation of motor buses in 1922; now it has a fleet of 189 coordinated with its rail lines.

The growth of this fleet in so short a space of time reveals what is taking place in railway circles these days. Railroads are studying their systems and as they do, motor buses and rail lines are being co-ordinated in a way that fits each

A Sharp Contrast Between the New White Six and One of That Company's Early Day Products. We Were Rather Proud of That Old Bus, Too, When It Drove Out the Little Jitneys.

carrier into its best place to give the public more complete transportation service on the most economical basis.

Santa Monica Into Passenger Business

The city of Santa Monica, Cal., believing itself adversely affected by the recent change in fares charged by the Pacific Electric Ry., is going into the passenger-carrying business as a municipality. Indeed it has already started by ordering eight of the White Company's Model 54, six-cylinder buses. These will go into service immediately between Santa Monica and the city limits of Los Angeles. The Los Angeles Railway Co., has bought six of the same buses, and the Connolly school district at Taft, Cal., has bought one for carrying pupils between the school and their homes. Taft is not far from Bakersfield.

Model 54, referred to here is built for 25 to 29 passengers. With its 100 horsepower motor this model has been developed to meet the new era in highway transportation and the complexities of present day traffic by establishing new standards of performance, greater flexibility, increased comfort and higher speed. To these advantages are added superior power control and safety.

To its other attractions the new White Six adds exceptionally comfortable riding features with which the passengers are more concerned than they are with the purely technical items responsible for their safe and speedy transportation. About the first thing a passenger examines, nowdays, is the seat and its upholstery. Having found this satisfactory he notices the springs, if there are any; speed is next considered, and about the same time the passenger wonders about the matter of control. The New Model 54 now going into service for Santa Monica and other interests, has all the requirements. Nine-inch balloon tires, single front and dual rear, are used to improve the riding qualities to the extent that the bus compares favorably with the riding qualities of high grade private cars. Proper size of balloon tires adapted to carry economically heavy loads at high operating speeds, combined with properly designed steering mechanism to facilitate the handling of the bus, is a distinct advancement because it permits higher average operating speeds without discomfort to the passengers or overtaxing the bus equipment.

Since the passenger load of a

Think of the Benches They Used to Give Us in the First Buses, and Gaze on This Upholstered Model 54 From the White Company's Plant at Cleveland.

Santa Monica Has Bought Eight of These Handsome White Six, Model 54 Buses for Service Between That City and the Los Angeles City Limits

bus varies through wide range, from full capacity to only a few passengers, rear springs of the chassis were designed to take care of this pay load variation and to preserve riding comfort under all conditions of passenger load. The rear springs are of two-stage construction, and these stages are so proportioned as properly to control the deflection of springs through the complete range of variation of pay load. When the bus is fully loaded, the rear springs are in a slight reverse camber, which feature, combined with two-stage construction, results in the desirable spring action of the chassis.

In respect to upholstery, the new bus is not surpassed by anything seen on the Pacific Coast.

Bus and Air Mail to Cooperate

Motor bus service, designed to hasten deliveries and collections in Central Texas and to make the air mail service worth more to smaller towns, was put into operation out of Austin, Tex., May 25, under a temporary contract to be supplanted by a permanent one August 1.

The Efficiency of Buses and Trucks

By H. F. Fritch
Prest. B & M Transpn. Co.

The railroads are rapidly adopting the motor bus and truck as aids in more efficiently serving their public. The automobile has materially affected the volume and characteristics of the passenger business of the railroad, resulting in the passenger traffic on many of the branch lines dwindling to a point where a cheaper method of transportation must be found or organized transportation abandoned.

Motor buses are being used to furnish service on some such branch lines to the advantage of both the public and the railroad, the former receiving a service in some respects more convenient than the infrequent rail service, and the latter profiting by reduction in operating expenses.

Similarly, buses are being used to advantage to supplement rail service by filling in the gaps between trains and serving stations intermediate to express stopping points. This latter use makes possible the speeding up of inter-city train runs by eliminating the local train stops.

Bus service, when properly coordinated with rail service, can be an aid in strengthening the railroad as a transportation unit. This accomplishment benefits the communities and industries which the railroad serves.

This Crazy World

The "Opel Rocket Car," propelled forward by the explosion of rockets placed in the rear of the machine, was demonstrated for the first time on the Avus Speedway near Berlin, May 23, attaining a speed estimated at 100 miles an hour. Fritz von Opel was at the wheel.

The car started with a terrific roar, emitting a sheet of flame and a cloud of yellow smoke as the successive rockets exploded. The machine gained momentum as one rocket after another, all of uniform power, was shot off, the car taking a lunge forward every time a rocket exploded.

Tunkhannock Viaduct on the Lackawanna Railroad

HERE we see one more fine example of outstanding engineering accomplishment, and at the same time another worthy example of concrete construction—the Tunkhannock Viaduct of the Lackawanna Railroad, said to be the largest concrete bridge on earth. We have learned through the years to be careful of superlatives, so the contributor of this very handsome picture must be content with the qualifying description used so frequently by a certain kind of newspaper which likes to say things without being forced to pay for the liberty; so, Tunkhannock Viaduct is "said to be" the largest concrete bridge on earth. Maybe it is. Certainly, it is very beautiful.

The structure pictured here carries the main line of the Lackawanna Railroad across the valley of Tunkhannock Creek, between Buffalo and New York. It is 240 feet high, almost a mile long, and contains 4,509,000 cubic feet of concrete and 2,280,000 pounds of reinforcing steel. The viaduct is between Binghamton, N. Y., and Scranton, Pa., near the anthracite fields.

Another Sensible Decision

A railroad cannot be held liable for injuries sustained by a passenger in an automobile that was turned over in an effort to avoid a train at a grade crossing, the Georgia court of appeals has decided at Atlanta, in a case appealed from Peach county. Although the lower court had granted a new trial, there is no need for the litigation to proceed further, the high court held.

T. D. Shepherd had sued the Central of Georgia for $5000, alleging that he was hurt when an automobile was turned off the road to dodge a freight train at a grade crossing. He alleged that the train gave no warning of its approach and was not seen until the automobile was within ten feet of the track.

The court of appeals pointed out that the automobile left the highway 49 feet from the crossing and turned over 31 feet from the tracks, although, being a Ford, it should have been stopped within the space of from 10 to 30 feet, if going at a speed of 10 miles an hour, as claimed.

Only $5,000

Accommodations aboard the British dirigible R-100 on its maiden voyage across the Atlantic next summer will cost passengers at least $5000 a head, it was announced a few days ago.

According to statistics compiled by the Interstate Commerce Commission from 170 Class 1 railroads, these companies employed 1,614,280 persons in January, 1928, compared with 1,724,243 in January, 1927, and paid $230,972,228, compared with $244,565,629 for their services.

Little Stories About Big Men

President Baldwin of the Missouri Pacific; Colonel Thom, General Counsel for the Association of Railway Executives; President Downs of the Illinois Central; President McDonald of the Southern Pacific, Texas and Louisiana Lines, Just After Calling on the President With Respect to Mississippi River Matters.

SOME way or other you just can't imagine L. W. Baldwin of the Missouri Pacific trading hats with A. D. McDonald of the S. P. Or even with Colonel Thom. He might, perhaps, make the change with Mr. Downs, of the Illinois Central. All great railroad men, these, but mighty different in their choice of hats, and the way they wear them and care for them afterward. Using the hats and nothing else as your guide you might be forgiven, if you are a student of men, for declaring that the first man on the left is an operating official, the men under the derbies lawyers or traffic men, and the man between them an engineer. You couldn't be mistaken in this—not if you know engineers, and we have studied them from the days they spent staking out the campus to the pinnacle of their careers on railroads.

But your opinion of yourself as a judge of human beings is in for a shock when you examine the big red volume, "Who's Who," because it shows that Mr. Baldwin and Mr. Downs had the same kind of college training; Colonel Thom was born an attorney and has always been one, while Mr. McDonald — Angus, if you want the Scotch, Angus Daniel—is a graduate of Notre Dame, began his railroading as a clerk in the accounting department of the S. P. at Houston, and worked his way along in that branch of the service to the top: clerk, accountant, auditor, controller, and so on.

Lewis Warrington Baldwin, whose office-on-wheels is called "the car of a thousand coffee cups," is a terrific worker whose hat gives no indication of which way he is going. He and Senator Capper of Kansas might trade hats and never know which had which. The only time the Kansas senator ever wore a derby was during Charles Evans Hughes's campaign for the Presidency in 1916, when the two of them rode together in a parade at Topeka; and Hughes was defeated. Mr. Baldwin simply wouldn't be at home under a derby, and neither would Mr. Capper. Both are slaves of detail, night workers, master students of many things. But the similarity ends right there, Mr. Capper's views on railroad rates and the net return being directly opposed to Mr. Baldwin's.

Mr. Baldwin's way of sizing up big things was pretty well shown in a story told one day about one of his executive assistants who had conceived a rather brilliant plan for enlisting thousands of Missouri Pacific agents in a scheme for getting local publicity. The president examined the pile of letters to be sent the various officials according to their rank, a most formidable outfit, tossed them all back across the desk, and said:

"If that were all it takes to get something done I could take you, a secretary and an interpreter and run all the railroads in the world."

Then, observing the crestfallen look of the man who had worked out the letter campaign, he added:

"The idea is good and it should be put into operation, but this is how to do it. Go right now and explain it to the general manager and get his approval. Then, with

his consent, see each of the general superintendents and get their approval and promise of assistance. Then, with their consent, go and see a superintendent and sell him the idea. Get him to go with you and explain the plan in detail to an agent. Then you go with the agent and show him how to do what you have in mind."

And then, with a twinkle in his eye, he added, "And go back in thirty or sixty days and check up on them to see that they are doing it."

Colonel Thom, as we all know, always has been a lawyer. His oldest friends declare that in his boyhood, away back in the grades, his parents used to have to take a law book away from him at night, and blow out the light or turn it off, or whatever it was that parents did in those days. And he has been a lawyer throughout his interesting career, for many years of the time engaged in corporation matters, railroad cases, the directing of big transportation questions. Despite this fact the colonel has kept sweet tempered. Moreover, he has trained a son to follow in his footsteps which may or may not be a commendable thing, according to the way you think about legal careers.

It will be noticed, at this point, it is hoped, that President Downs wears his hat a trifle straighter than Mr. Baldwin despite the fact that both had the training of engineers. Mr. Downs is a Purdue man, "six feet of husky Irishman," a recent writer said of him, a hard worker, exceptionally considerate of others below him in the ranks, thoughtful and kind, firm as a rock in his determination to do what he starts out to do, and absolutely fair. His private secretary who, naturally, knows more about him than anyone on earth except Mrs. Downs, says he is the easiest man imaginable to work for, "but you must do your stuff." He has in a large degree the saving grace of good humor, and all the patience of a man who has achieved much from very little, a man whom the employes respect highly, and still call "Larry."

Mr. Downs, thank goodness, has no foolish ideas about how he gained the presidency of the Illinois Central. He is a worker from a family of workers. His father, James Downs, was for forty years a section foremen, and this may have had its influence in directing his mind toward railroad work and the building of things used in transportation. In a family of eight children he was the only one who hankered after a college education, and his father and elder brothers saw to it that he had his wish.

After graduation, while he was working for $40 a month on the Vandalia, he journeyed over to St. Louis one day to see a ball game, and there met a former classmate who was working for the Illinois Central and getting $75 a month, a difference that made its impression on the future president. Talking about it one day Mr. Downs said, "I told him that if he should see a chance up there for a lad like me to let me know about it. Five months later I had a job on the I. C. and was getting $60."

To Lawrence Downs the steps in his career have been erected merely as a result of hard work and its reward, and he does not forget that in thousands of cases the reward comes too late to be enjoyed, and that sometimes it doesn't come at all, a proof of the man's humanness.

"Forget once for all," said he, "the impression that there was destiny or heroics mixed up in it. That's mush! I'm an average Indian.

"When I was a kid out of college, I went hunting a job, as any boy does. Jobs were scarce then, because it was 1894, and a great panic had just swept the country. I went to work for the railroad, because the railroad could use a chap like me, and thought I was worth about forty dollars a month.

"I stuck to railroading because I never saw a good enough reason to think I could do better, or be happier, anywhere else—."

Like most men of his stamp Mr. Downs doesn't like to be pointed to as an example, notwithstanding the fact that such examples are priceless in directing the lives of younger men. You can't make him admit any special, outstanding reason for promotion in his own case except his firm belief in the chance for a chap who "does his stuff," and the vernacular is peculiarly expressive here. "I couldn't tell you," he said, "what special reasons there were, if any, for these first promotions. Such steps were natural on the railroad for a young fellow who did his stuff. I simply tried to fill a job creditably. That, I'm sure, is the first step to promotion: to do your stuff where you are. The spectacular things are rare and don't matter very much. The thing that does matter is the cumulative effect of many little jobs done well.

"As I went along from job to job I learned gradually that promotion was a thing I had to look out for on my own hook; I couldn't leave it entirely to the boss. Get that in mind, for it's one fact that matters. Promotion isn't wholly the employer's affair—it's also a man's business to bring himself to the employer's notice, quietly but successfully, as one worthy of promotion.

"Sensing this, I made a practice, about as soon as I got my chair warm in every new job, to look around and see what might be next in line, and to fit myself, in case the opportunity for such a promotion ever came, by doing two things: First, studying the requirements and duties of the job ahead; and, second, convincing my immediate superior, not by argument but by my actions, that I was one of the best assistants he had.

"Of course a good deal happens in a man's life that he isn't responsible for. Fortunate openings occur. There are heroes of circum-

stance, just as there are victims. But in planning for promotion, it is safe to remember that such 'breaks' are occurring all the time, and, other things being equal, the advantage goes to the man who is ready."

Six Weeks in a Business Car

Two men started over the Great Northern one day, a few years ago, in the president's business car. Their mission on earth was that of telling the people along the line a few well-selected facts about rates and crazy legislation and other exciting things then, as now, disturbing the minds of railroad managers and their patrons. The comfortable car had been assigned to them not as a luxury or as a mark of distinction but for the simple reason that so many speeches were to be made that if regular trains and questionable hotels were used the program could not have been completed in an ordinary lifetime, which is no knock on Great Northern speed. However, a psychological fact not to be overlooked, the president's car is an impressive affair, and doubtless has its scenic value in the picture.

M. L. Countryman, Now Special Counsel for the Great Northern.

One of these heralds of good tidings was M. L. Countryman, at that time vice president and general counsel of the Great Northern, and now special counsel. The other man's name is of no importance in this chronicle the whole purpose of which is to convey something interesting about a most unusual personality, so unusual and delightful, indeed, that it stood the wear and tear of more than six weeks' confinement in the president's car and left the other man wishing, at the end of the tour, it might be done over again. Six weeks of riding, eating, sleeping, reading, living the inevitable intimacy of a car—two travelers, studying and talking about rates and law and wage disputes, strikes, car shortages and their reason, curious and sometimes critical audiences—surely this is the supreme test of a man's tolerance and good temper. Few can stand the strain. No one who has not lived such an experience can have any intelligent conception of what little space there is in a business car, what constraint and petulance and irritability are likely to crop up in such confinement if one, at least, of the two concerned is not indeed the ideal traveling companion.

The other man confesses now that when President Budd told him the legal vice president would accompany him over the system as "introducer" he began to view with alarm. He had known many lawyers in his day and had not found them particularly buoyant spirits. In his experience a trip with an attorney meant hours of citations, writs of this and that, exceptions to be noted, objections to practically everything except his own views, and many days of overwhelming labor for the personal pronoun I, not forgetting the whereases and be it resolved. All of which shows how faulty one's judgment may be.

There was just a thin partition between the bedrooms of these two men. They had left St. Paul late at night and had gone immediately to bed. Neither had had a chance to size up the other very carefully except in a bridge game in which the lawyer's estimate of the other man certainly must have suffered deplorably. When time for rising came and breakfast was announced the train was far out on the western plains; it was winter, and the scene was not thrilling. The temperature in the car was low. The sky was cloudy. The windows were covered with frost-pictures painted by invisible artists in the night. "Well," said the other man to himself, "this certainly is an exciting life."

At that moment, from beyond the partition, a deep voice, filled with the joy of living, hailed the new day in a few well-chosen words from our old friend, Shakespeare:

"'Look, the gentle day,
Before the wheels of Phoebus, round about,
Dapples the drowsy east with spots of gray.'"

"Ah me," exclaimed the other man, "what's this assails my ears?"

—International Newsreel.

Monument to Alfred Escher at Zurich, Builder of the Great St. Gothard Tunnel; the James J. Hill of Switzerland.

And promptly came the joyous response from the general counsel, the while he stropped his razorblade,

"'The gray-eyed morn smiles on the frowning night,
Checkering the eastern clouds with streaks of light.'"

A moment later the assurance came, in deeper tones,

"'The day begins to break, and night is fled,
Whose pitchy mantle over-veil'd the earth.'"

"Hi, there," the other man called, "what's the time?"

"'Tis winter time," came the reply, cheerfully. And then, from some author unidentified,

"'Tis winter, yet there is no sound
Upon the air
Of winds along their battleground;
But gently there
The snow is falling—all around.'"

In all the years he had spent in trying to please railroad presidents and the public the other man had never heard anything like this. It changed the gloomy day. This journey, said he to himself, is going to be something to remember. Breakfast was a time of joy. So was luncheon, if eaten in the car, and dinner became an hour of quiet talk of things worth treasuring in after years. The general counsel's fund of prose and poetry and stories, old and new, seemed inexhaustible. After the two travelers had returned to the car, following the other man's first speech, the lawyer said, with great solemnity,

"'His words seemed oracles
That pierced their bosoms; and each man would turn
And gaze in wonder on his neighbor's face,
That with the like dumb-wonder answer'd him.
You could have heard the beating of your pulses while he spoke.'"

It wasn't forced. It just seemed the natural thing to say. From what deep well this man drew forth his memories no one could tell. Loud and continued applause, of course, and this produced another gem the listener liked to think was particularly well-chosen,

"'Whene'er he speaks, Heaven, how the listening throng
Dwells on the melting music of his tongue!
His arguments are emblems of his mein,
Mild but not faint, and forcing, though serene:
And when the power of eloquence he'd try,
Here lightning strikes you, there soft breezes sigh.'"

Six weeks never to be forgotten. Through all the states to the Pacific Coast and back to St. Paul, six weeks of tiresome speeches brightened afterward, by talks of books and travel and reminiscence. True, there were amusing diversions not originally put down on the program. From day to day the general counsel's introductions grew in impressiveness as they increased in length, until sometimes the scheduled thirty minutes at noon-day meals of clubs and chambers proved just long enough to let the other man say a word or

two on the current topic, a change of method which proved delightful not only to him but certainly to the audiences who loved the lawyer's stories. If you must talk rates, it doesn't do to take yourself too seriously. The audience may remember a half-forgotten engagement and sneak out before the finish.

The blow fell, however, at Duluth where the journey ended before going home to St. Paul. A special address had been prepared covering certain questions about which western presidents were just then much disturbed, and the other man was to deliver it. Advance copies were sent to the Duluth papers, of course — merely to save the tired reporters. The meeting was a great success. Practically every business interest was represented. So important was the occasion and the subject, and so very sincerely did the general counsel wish to let the limelight shine on his traveling companion and not on himself, that the customary introductory remarks were cut down to not more than two minutes.

Quite casually, as always is the case with public speakers, the two men bought the evening papers as soon as they could without attracting a crowd. They proved most astonishing. "Vice President Countryman," the Herald said, on the front page, "delivered the principal address, a masterpiece in its way. The other man also spoke."

" 'O, well,' " said the general counsel, smilingly, " 'tis thus that oft we profit by another's skill.' Perhaps you remember the comforting words of Mr. Burns of Scotland? He must have had some such experience as this when he wrote the words:

James M. Kurn, President of the Frisco System.

" 'The best laid schemes o' mice and men,
Gang aft a-gley'."

Born in a Railroad Station

If environment has anything to do with a boy's future James M. Kurn went quite naturally and properly into the railroad business. He was born in a station. The big event took place about 57 years ago, while his father was agent for the Grand Trunk at Mt. Clements, Mich. The family lived, as many a railroad family has, upstairs over the station so that, sentimentally at least, the first sound he heard after his parents' exclamations of delight was the click of a sounder which, we may as well say for the uninitiated, is patter for Morse telegraph.

The record does not show that Jimmy became greatly excited over the racket he heard, being more interested doubtless at that particular moment in other more personal things. As the days went by, however, the noise of trains and the telegraph and the thumping of trunks, not overlooking the angry protests of customers demanding rate reductions, certainly must have had an effect on the boy's mind. He learned telegraphy. There is a story to the effect that at seven years he was a good sender, but operators who know about such things take it with a large and imposing piece of salt.

We come to the reasonable thing in Jimmy Kurn's progress in his thirteenth year. The family had moved to West Branch, Mich., and there the boy got a job as messenger for the Western Union. Five dollars a month! A year later he had become, as many another boy has at that age, a fairly good operator, lacking only the judgment that comes with time. This omission gave Jimmy no concern whatever. If you don't know that you don't know anything why worry about it? So one fine day he called up the chief dispatcher of the Michigan Central and asked him for a job. Not knowing that Jimmy was only 14 the chief put him on as night operator at West Branch at $30 a month.

He went along all right. Nothing unpleasant happened until one day the chief came along over the line, visiting and decided he would

step in and see the night operator. He saw a boy at the bay window table.

"Son, where's the night operator?" the chief dispatcher inquired.

"I'm the night operator," said the boy.

The astonished dispatcher told him in a kindly tone that he was entirely too young for such responsible work. So he lost his first railroad job, and had to go to school. Curses!

Three years afterward he broke out with a malignant fever demanding his immediate presence in the Far West. Of course his parents protested, but they might just as well have talked into a boiler tube. Jimmy was going and he went. Chicago was the favored point, and there he got a job as night operator with the Pekin & Southwestern at Millsdale, Ill., a station about 60 miles west of Chicago, at $45 a month. The Santa Fe bought that road in a few months and Kurn then got a job at Topeka at $60 a month as telegraph operator in the chief dispatcher's office.

A short while later, in 1893, Kurn got his first promotion and became train dispatcher at $100 a month. Considering his youth and the buying power of the dollar at that time, it was a good job. But he wasn't satisfied to stay in that job. Five years later he became train dispatcher at Emporia at $125 a month. His next jump was to Colorado Springs in 1900, and then in a few weeks he became chief dispatcher for the Santa Fe at Pueblo at $140 a month.

Mr. Kurn's rise was steady from this point. He had all kinds of operating jobs—by which we mean operating department, not telegraphing—until finally he became division superintendent at San Marcial at $250. In four months he was sent with the same title and a raise of $50 to Las Vegas, N. M., and $300 was a whale of a salary 25 years ago.

In 1910 he became general superintendent at $550 a month and about that time he began to wonder what to do with his dough. In 1914 some worried bankers in New York heard of his good work and made him president of the Detroit, Toledo & Ironton, a very weak sister. He put the property on a paying basis and saw it sold to Henry Ford.

Mr. Kurn's next job of railroad surgery was as vice president of the Frisco in charge of operations in 1918. He became president two years later, and there he is. The story of his big success in building and rebuilding and extending that line is well known. He had a few rules as he went along. Here they are; they are worth pasting in your hat:

"Don't be a clock watcher.

"Anticipate the wishes and orders of your superior officer.

"Don't be afraid of hard work.

"Don't avoid work because it isn't your job.

"Save your money.

"Marry young."

The Youthful Heart of Chauncey Depew

It may be many a year before men cease to tell stories about the late Chauncey M. Depew. Other men of this generation and the last whose names no longer are mentioned contributed more to the sum total of human comforts and conveniences and happiness but they are almost forgotten, because, perhaps unintentionally, they became indifferent about their human relations — they were unsociable — some were grouchy.

Depew stayed young to the last because he kept his heart young. Never for a moment did he lose his keen interest in men and events. Naturally he didn't go around slapping people on the back or pulling chairs from under them; that wasn't his idea of humor. It is altogether probable too, that he never threw a pie at anyone in his whole career, but nevertheless his reputation as a humorist was world wide.

In one interesting way Mr. Depew provided an example for the other railroad men to follow. He made friends for his company without forever and ever talking about it, a fine trait overlooked by many otherwise clever gentlemen.

The point was beautifully illustrated the other day by an English visitor in Los Angeles. "Of all the many interesting observations I have recorded since coming over," said the traveler, "I find two in particular worth mentioning at this moment. I have attended services in eleven churches, and have heard seven railroad presidents speak in public. Both seemed horribly depressed over money—both the preachers and the presidents. They made me positively unhappy."

Very often it's the man behind your chair who sees the mistakes you make in playing your cards, the man on the outside looking in. There can be no reasonable doubt that some railroad men have added immeasurably to their own burdens by glooming around over the country convincing themselves and those they meet that the whole public is down on the railroads. These are the men whose desks are never clear, who live behind or under a stack of correspondence a foot high most of which would accomplish as good a purpose if it was dumped in the fireplace, whose private secretaries are humble, browbeaten chaps to be pitied. No better treatment for such burdened souls could be suggested than the reading of Chauncey Depew's addresses. His Memories of Eighty Years ought to put new hope into the most pessimistic executive.

This brings up, appropriately, the question of reading. Many heavily burdened officials fall into the deadly belief that they have no time for the reading of good books. Deadly is the right word. The man who doesn't know the history of his business, the biographies of its founders is like a young attorney without a digest of court decisions. He may prove to be the world's marvel and show his ability to create valuable original conclusions—but chances are against him.

Hobbies of Leaders In Mechanics

Outstanding Developments

A Symposium

J. B. Ennis, American Locomotive Co.; W. E. Woodard and W. H. Winterrowd, Lima Locomotive Co., and F. H. Hardin, Asst. to President, New York Central Lines.

THE snap shot you see before you is the best I could do in the way of photographs. It shows J. B. Ennis, American Locomotive Co., W. E. Woodard, Lima Locomotive Co., W. H. Winterrowd, Lima Locomotive Co. and 'yours truly.'

In my humble opinion there have been so many important developments in the railroad field that it is difficult, if not impossible, to say what is the most important. After all, I believe it is the ability of the railroads to continue increasing the efficiency of service and operation in spite of the vast strides which have been made in recent years.

F. H. Hardin

Here is a snapshot of myself fishing in the Minnesota woods; a snapshot of G. S. Goodwin, asst. genl. supt. motive power, camping in the Wisconsin woods, and one of Peter Kass, supt. car department, at home.

I believe the greatest achievement in the mechanical department since the convention in 1926 has been made in running passenger and freight trains over more than two divisions, dispensing with numerous terminals, and making a very material saving in the maintenance and handling of power. This in connection with the development of the super-locomotive which seems to be answering all purposes economically.

L. A. Richardson

One of the outstanding improvements since the convention of 1926 is the increasing development of the so-called superpower locomotive. This is making possible greater economies in fuel, notwithstanding the engines are handling larger trains and at higher speeds. This development will certainly justify the retirement of present engines which have been considered of modern design up to within a very short time.

G. S. Goodwin

This picture was taken at Atlantic City, June 15, 1920. It shows me—the one wearing goggles—in one of the last airplanes to fly over that city as the law forbidding

(Continued on Page 66)

Left to Right: J. L. Bracken, Asst. to Mech. Supt.; A. L. Ralston, Mech. Supt.; Mrs. W. L. Bean; E. J. Ball, Supt. Van Nest Shops; R. Navarette, Mach. Foreman; T. Pest, Supvr. Health and Recreation; Mrs. T. Pest; Mrs. G. A. Morarity; W. L. Bean, Mech. Mgr., New Haven Lines.

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TO CAR STRUCTURE AND LADING, USE →

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→ GOODWIN SIDE BEARINGS

→ SESSIONS-STANDARD DRAFT GEARS
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GOODWIN SIDE BEARINGS

COUPLER CO.

CHICAGO

ATLANTIC CITY

George S. Goodwin, Asst. Gen. Supt. M. P., Rock Island Lines, In the Wisconsin Woods With His Family.

J. Dickson, Supt. M. P., Spokane, Portland & Seattle Ry., Portland.

(Continued from Page 63.)

planes to fly over the city went into effect the next day.

I consider the most important development in railroading since the last M. M. and M. C. B. convention held at Atlantic City in 1926 to be the adoption of the airplane for passenger service and feel satisfied that the mechanical men of the railroads will make a big improvement in the airplane if given the opportunity.

I do not hestitate to predict that within the next ten years some railroad man will develop an airplane that will be able to ascend or descend in a very limited space. After this has been accomplished, it will be an easy matter for airplanes to light on top of the Pullman car and take on or let off passengers without the train stopping.

A. E. Herrold

Here is a snapshot of myself and grandson, John Putney Dickson,

A. E. Herrold, M. M. and M. C. B., Monongahela Connecting R. R. Co., Pittsburgh.

who at the time the picture was taken was three years old, Aug. 24, 1927.

I consider the booster and the developments for heating feed water the most important developments since the convention of 1926.

J. Dickson

I have no picture of myself but am enclosing one taken February 1, 1927, showing my day force at Port Arthur, with our engine failure board written up to February 1, 1927. This is my "hobby," preventing engine failures. Our record at Port Arthur up to May 1, 1928, was:

Date of last failure...June 11, 1925	
Miles since last failure.....	317,441
Yard engines dispatched since last failure	6,425

In my opinion the most important development in railroading since the last convention in 1926, is increased mileage of locomotives per run and the exceptional results obtained on Interstate Commerce inspection of locomotives, which, I believe, is showing fewer defective locomotives than ever before.

T. J. Clayton

(Continued on Page 68)

L. A. Richardson, Gen. Supt. M. P., Rock Island Lines, Chicago.

A Fine Record for Engine Failures Is Shown On The Board in This Picture, Sent by T. J. Clayton, Master Mechanic for the Texarkana & Ft. Smith Ry.

Looking Forward

PROBABLY the largest single element in national prosperity is the efficient, economical railroad operation which is the prime factor in nationwide use of fruits and vegetables of the Pacific Coast, grains of the middlewest and all the varied products of farms, mines and factories distant hundreds—even thousands—of miles from the ultimate consumer.

Railroads are built by citizens who pool their savings in expectation of profits just as partners join resources to start a grocery store or a grain elevator. When profits fail no new money is forthcoming to build new, or extend old enterprises, whether the unprofitable venture be a railroad requiring tens of millions or a grocery store needing hundreds of dollars.

For ten years, in spite of unprecedented efficiency and economy, American railroads have not made profits sufficient to attract adequate new capital.

Railroads will remain the backbone of the nation's transportation system, despite the development of aircraft and motor vehicles. Railroad executives, looking forward, ask themselves this question: "How are the carriers to keep step with the nation's growth unless allowed to earn that reasonable return which will make railroad investments as attractive as other securities?"

SOUTHERN PACIFIC

F. M. Brazier Asst. to Gen. Supt. M. P. & Rolling Stock, New York Central.

Left to Right: H. G. Rand, Regional Air Brake Inspector; G. A. Morarity, Gen. Mechl. Supt.; C. W. Booth, M. M.; W. R. Sederquest, M. M.; John McGann, General Car Foreman, New Haven Lines.

(Continued from Page 66)

I regret I have no particular hobby unless it might be baseball and taking trips over the country, "Seeing America First." I enclose you a picture that was taken in Florida in 1927 shooting alligators.

As to the most important development in railroading since our last convention in 1926: To me it is the inroad that automobile buses are making in our passenger service. In some cases railroads have taken off trains on many divisions. Most of the railroads are interested in these bus lines and can operate them cheaper than local trains.

O. B. Schoenky, Supt. M. P. Southern Pacific.

Now the airplane is being talked about to save time on long distances; in fact, some roads are contemplating making the trip from New York to California in the daytime by airplane and railroad train at night.

The next important thing is electrification. This will no doubt be the future power as many roads that are now partly electrified are planning to extend the system over their entire lines. At our convention in 1904, in my address as chairman, I predicted that the electric power was coming into use. No doubt the federal and city governments would compel the railroads to adopt it whether they were willing or not. It is a fact that New York state has already taken such action on trains entering New York City.

Now, after 51 years of service I can see constant improvements in passenger cars, locomotives and train service so that the railroads of this country are second to none in the world. We are indebted for many of these im-

(Continued on Page 70)

P. Kass, Supt. Car Dept. Rock Island Lines At Home.

R. U. Lipscomb, Supt. M. P., Southern Pacific, El Paso.

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Booth 623
Atlantic City Convention
American Railway Association

Mechanical Division - Purchase & Stores Division

June 20 to 27
1928

THE personnel of our Railroad Department will be present to welcome attending delegates

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and ACCESSORIES
will be exhibited

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Railroad Department

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New York

1004 Mutual Bldg.
Richmond, Va.

310 S. Michigan Ave.
Chicago

(Continued from Page 68)
provements to the Master Car Builders and Master Mechanics Association of the United States and Canada. The results in the future will be a study of all things that pertain to improvements by this association to perfect the service.

F. W. Brazier

I am sending herewith one of my pictures preparatory for work, as I have none showing myself actually at work.

As for what I think the most important development in railroading on my district since the convention of 1926: We have completed one district with the installation of Zeolite Water Softeners. This was a bad water district, and this installation has now been in service long enough to prove to us that the water furnished from these plants has entirely eliminated leaky engines, and is effecting enormous savings in boiler work.

O. B. Schoenky

I think the combined locomotive cylinder and frame casting as produced by the Commonwealth Steel Co. is the particular outstanding feature in locomotive design in the past two years. This undoubtedly will result in greater serviceability of the locomotive and reduction in maintenance costs.

Another development, that of the three-cylinder compound locomotive, designed by the Baldwin Locomotive works, has shown remarkable fuel economies at variour power ranges to warrant greater construction when using high boiler pressure.

It is also noteworthy to mention the remarkable economies effected in the use of the Caprotti valve gear on the B. & O. test engine.

F. S. Robbins

Waiving apologies I am complying with your request and sending you a kodak picture of myself, taken recently at my boyhood's swimming hole, which, as a child, was in an obscure location away from the madding crowd. Today, the road crossing, which is the same as formerly, seems only a stone's throw, and from a man's viewpoint, entirely too conspicuous for the days when bathing suits were unknown.

R. U. Lipscomb

Railroading today is primarily wholesale transportation. Yesterday it was wholesale and retail.

The most important development since the last Mechanical Convention has been the raising of motive power standards incident to this change. Higher speed, the necessity of having better power to give more miles per failure, better and stronger equip ment, more production per train hour, and less coal per thousand gross ton miles, are in order.

The marks of today are high; —those of tomorrow will be even higher.

Lawrence Richardson

There has been a very marked improvement in freight car equipment in the past year, brought about by the addition of new equipment of steel construction. No greater factor has had so large an influence on the ability of the railroads to provide faster schedules and at the same time insure on-time performance to a greater degree than formerly, reducing hazards, maintenance costs and claims.

The modern car as built by the various railroads today represents a closer uniformity of construction than obtained in previous years. Too much credit cannot be given the car construction committee for its splendid work in designing car equipment that embraces so many uniform details, and which has met with so much approval throughout the country. The A. R. A. standard box car is a good example of the car construction committee work in the direction of uniform car equipment.

A further development which has come to the front very rapidly in the past few years, is the development of the self-propelled passenger train car. With the constant reduction in railroad passenger travel, railroads have been forced to replace steam trains with more economical transportation units. This situation has had more to do with the high rate of progress made in the development of various practical self-propelled cars. The general opinion is that the gas electric car is the best adapted for railroad service and has the best results.

P. Kass

Back-fire From a Commuter

A letter dated May 27 has been received from New York signed, "D. & L. W. Commuter." Here it is:

I have just read an article in your May issue of "Transportation" in regard to DL&W electrification. I have read so many articles, in newspapers and magazines, relative to the willingness of commuters to pay increased commutation fares for electrification, that I just can't seem to restrain myself any longer.

I have been a commuter on that road for 15 years and have many friends who are also commuters. The first any of us knew (and I believe I am truly speaking for the masses) that "we" had agreed to increased fares was when we picked up our morning paper and saw the article. We knew nothing about any representatives of our communities meeting with officials of that road.

We are all human beings (probably not in the eyes of the railroad company) and we like to be treated as such; not as ignoramusses. I, and others to whom I have spoken, are agreed that we would liked to have been consulted as to how much more, etc. We would liked to have had some say as to whom our representative at the meeting should be. We would liked to have known, as a matter of fact, that such a meeting was considered. Probably we would all then feel more satisfied that "we" had agreed to increased fares.

But the singular thing about the matter was that in a good many instances, particularly my own, the "representatives" of the communities were real estate men and not even commuters! Whether or not this was true in every instance, I cannot say. There is no question that from a real estate standpoint electrification will prove a boom —for the pockets of said real estate operators.

I am writing you as it does become sort of exasperating to continually see where "the commuters" agreed to the matter when we were never consulted and knew nothing about it until we read it in the papers.

I am not signing my name as I want no notoriety of any kind. I am not entering opposition to electrification. I am merely trying to correct an impression that seems to have been erroneously conveyed to the public in what I consider a flagrant disregard of "the commuters."

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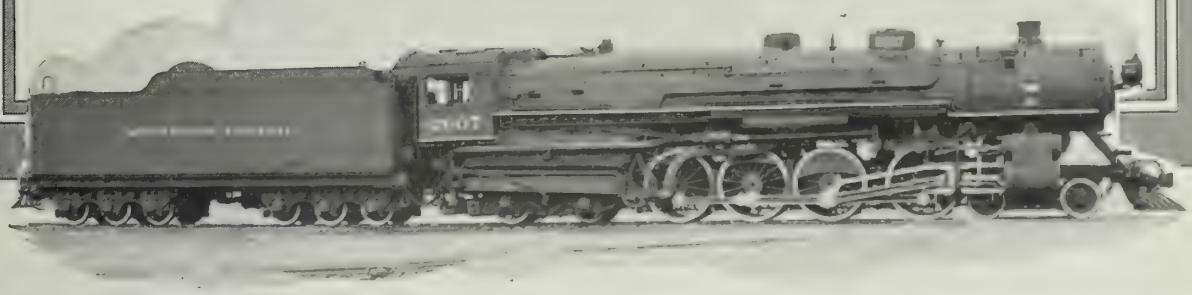
includes headlights and turbo-generators, locomotive train lighting systems, turbo-generators for train control service, floodlight projectors, and a full line of fittings and wiring appliances for locomotive, car, shop and floodlighting installations.

See the complete line exhibited at Atlantic City, Space 602-4-6-8 on the Pier, or send for catalogs and bulletins with full descriptions.



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311 Builders Exchange Bldg., St. Paul, Minn.

A New Hopper Car Is Announced

Increased Load and Speed

By W. J. Parke

A HOPPER car of large capacity, especially designed to meet present day operating conditions of increased tonnage at higher speeds is one of the important exhibits arranged for the American Railway Association convention at Atlantic City this month The car was designed by the Wine Railway Applicance Co., and was built for it by the Ralston Steel Car Co., at Columbus, O.

In addition to the qualifications mentioned the new car design provides, low center of gravity; maximum width and minimum length for its capacity; flexibility of design to permit various capacities without change in any essential detail; use of accepted car specialties of various manufacturers; liberal use of cast steel and rolled sections thereby greatly reducing the number of pressed steel parts; a concentration of metal, reducing the surface exposed and the weakening effect of corrosion; suitability for handling the very small sizes of hard coal without loss due to sifting through small openings.

The New Hopper Car to Be Exhibited At Atlantic City by the Wine Railway Appliance Co.

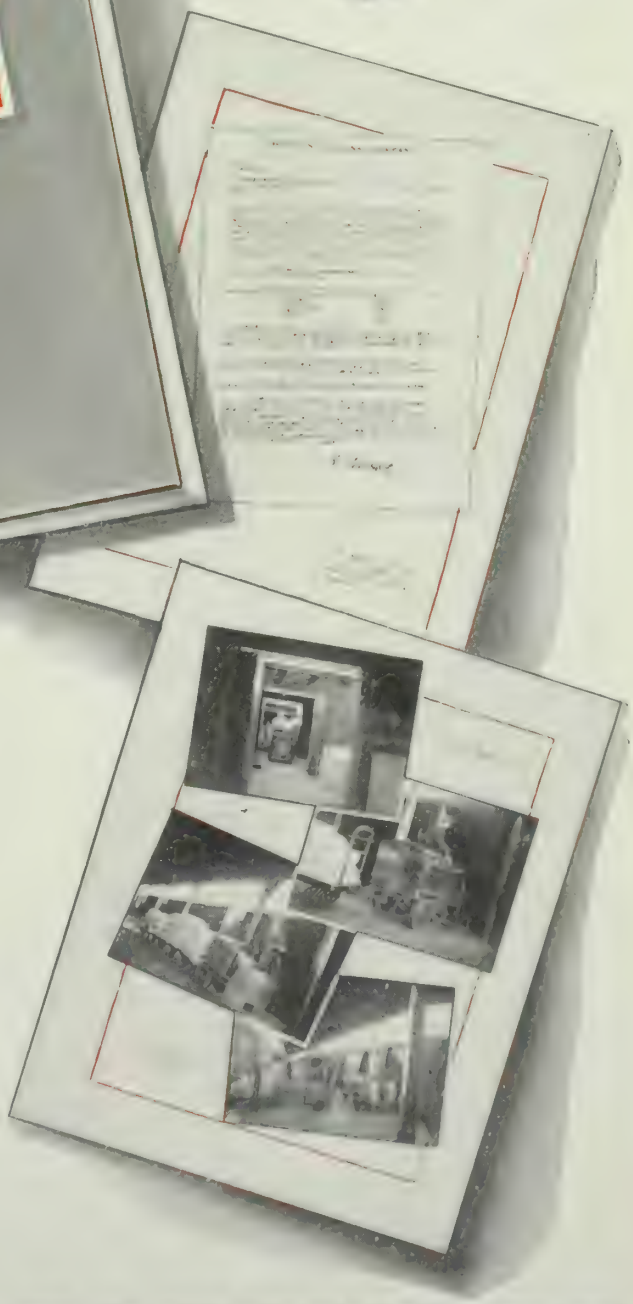
The coupled length of the car is only 41′ 6″. The length over buffers is 39′ 0″ and the inside clear length of the car body is 38′ 0″. The extreme width 10′ 2½″ and the height from the rail to the top of the side is 10′ 8″. The capacity of the car is 2716 cubic feet and the light weight is 50,400 pounds. Four double hoppers with large door openings, facilitate easy and rapid discharge of lading. All details of the hoppers, such as the side sheets, stiffeners, cast frames, door spreaders and doors are standardized and interchangeable, thus minimizing the number of repair parts required for stock. This applies throughout the entire car design. The hopper doors are corrugated steel, each set operating independently of the other.

In order to shorten the car, and also to lower its center of gravity while still maintaining its unusually large capacity, the end hoppers are depressed in the floor of the hopper to clear the wheels. This feature is entirely self-clearing for all ordinary lading.

The hoppers have a cast steel door frame which gives a very rigid construction and maintains the alignment. The frame carries the hinge lugs which prevent the doors from getting out of line once they are fitted in the proper location. The frames also insure against loss of lading through the doors because there can be no change in the door fits due to weaving of the car body. The finest dry lading can be hauled without loss through the door fit. The cast frame ties into both the center sill and side sill, increasing the rigidity of the understructure of the car.

Another important advantage of the cast steel frame is that it gives a much longer life to the material around the door fit where the con-

(Continued on Page 74)



How Portland Terminal Saved $4000 in March, 1926

In L. C. L. Freight Handling Costs

They saved $1400 in November—$1900 in December—$2600 in January—$2100 in February—$4000 in March. They estimated April saving would exceed March.

How did they do it?

How did 15 others do as well or better?

This book explains and shows pictorially how your handling costs can be reduced to basic levels.

Have a copy on your desk. Instruct your secretary to write for it today, without fail.

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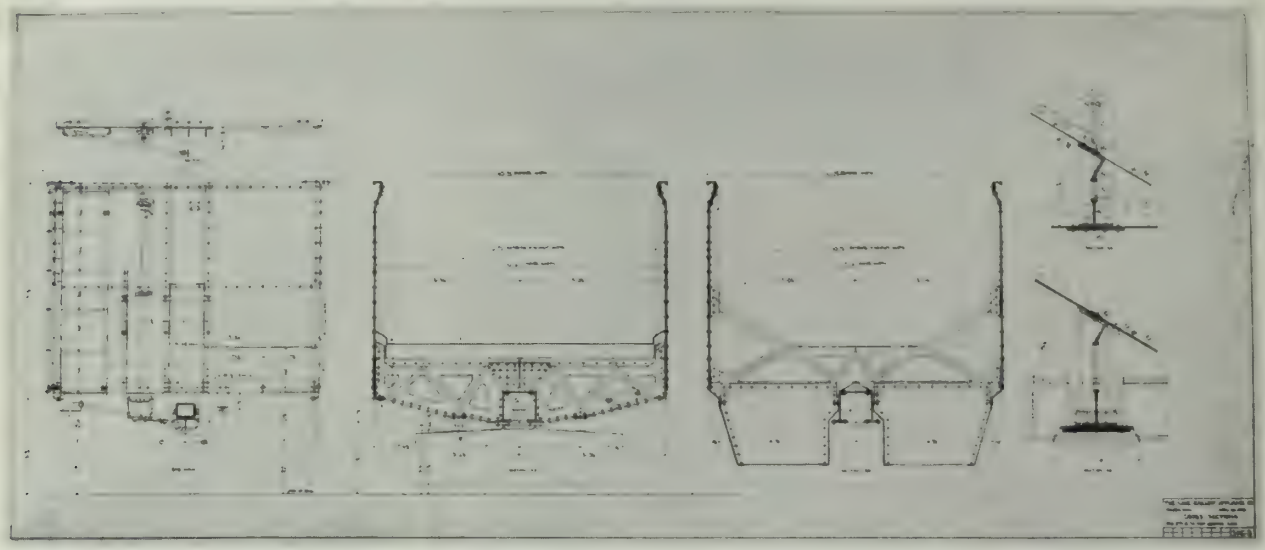


(Continued from Page 73)

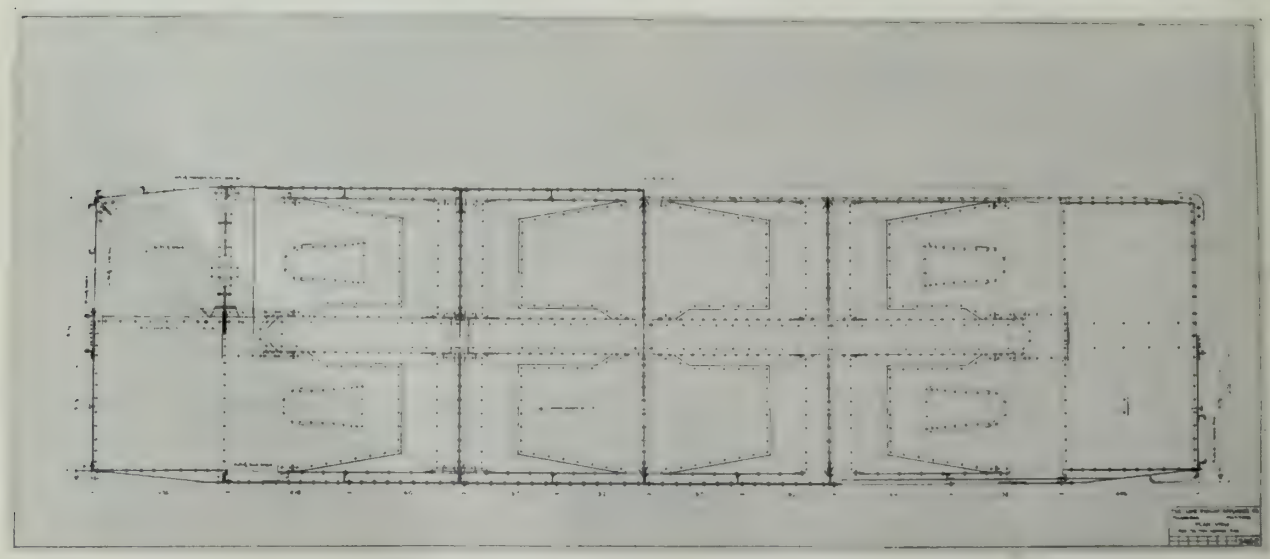
ventional lapping of sheets quickly rusts out.

Increased loading capacity, over the conventional type of hopper car with outside stakes, is provided by placing the stakes inside the side sheets. There are nine stakes on each side of the car, each being 4″ x 3½″ by ⅜″ bulb angles, the same section as used for the top coping angle. Two stakes on each side rivet direct to the cast steel bolster and three on each side rivet direct to the cast steel cross bearers. The cross bearers also tie into the side stake about half way up the side of the car thereby eliminating all cross ties from the car. The corresponding side stakes are interchangeable for either side. The whole side of the car, as fabricated, can be used without change on either side.

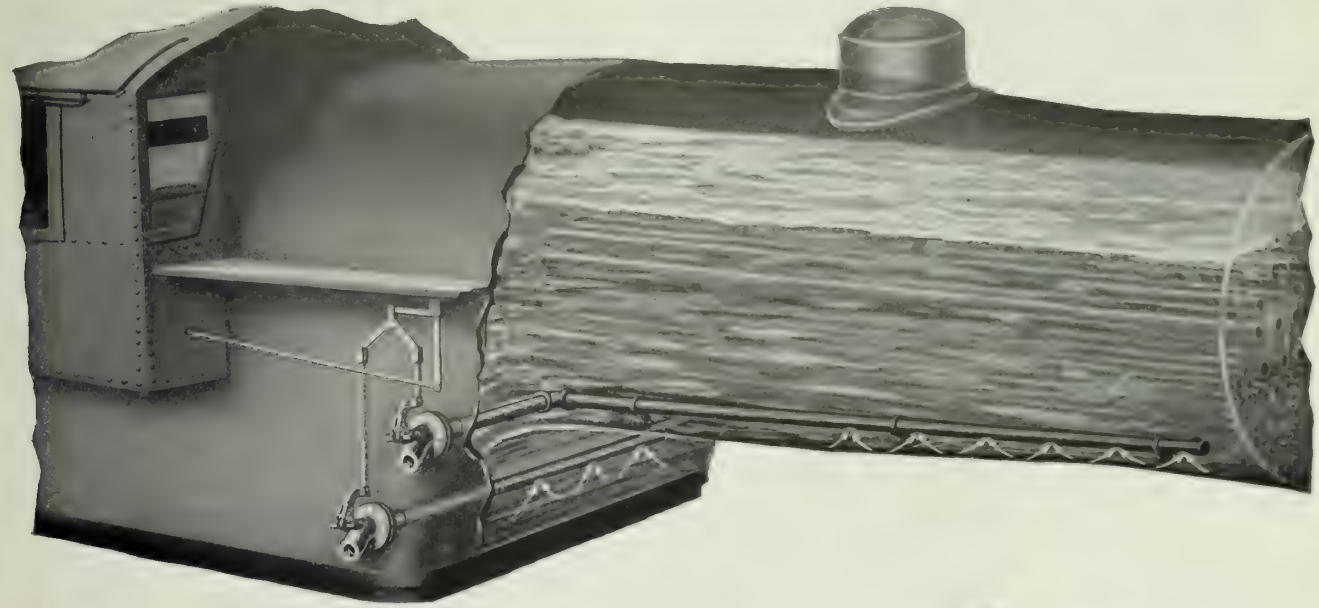
The underframe is of the built up type with two enter sills composed of A. R. A. standard 12″ special rolled section weighing 40.3 lbs. per foot, with flanges turned in at the top and extending the full length of the car. The top cover plate is ½″ by 13½″. The end of the sills are coped away to receive the buffer attachments. The Union coupler centering device combined with the striking casting is used. The side sills are made up of ⅜″ by 10½″ plate pressing running the full length of the car. The center portion between the bolsters being a Z section with legs vertical, and a sloping web changing to a deep, angle section just before reaching the bolsters and extending from there to the end of the car. The sloping web of the side sill gives a self-clearing feature on the inside of the car without the use of additional slope sheets or pressings. To make the car 100 per cent self clearing, the conventional hood sheet is used over the exposed portions of the center sill.

The body bolsters are cast steel, truss type, spliced at the center over the center sills. Particular attention was given in designing the bolster to getting ample strength at the body bearing location as well as the connections at the bolster, side frame and side sill. The cross bearers are cast steel, truss type, and extend across the full

(Continued on Page 76)



THE B-A-CO. SLUDGE REMOVER



A CLEAN boiler, like a clean conscience, means freedom from a lot of worry. Every locomotive man knows what these troubles are: Scale formation, foaming, corrosion, boiler tube and firebox leaks.

It is also realized that removal of the sludge, even with the blow-off cocks alone, will greatly relieve these troubles, especially where chemical treatment to throw down scale-forming solids is used. The B.-A. Co. Sludge Remover multiplies this relief many times over.

Locomotive Blow-Off Cock (Wilson Type—For Sludge Remover or Internal Pipe Application)

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(Continued from Page 74)

width of the car. The corner diagonal braces are 6″ x 3½″ by ⅜″ angle riveted direct to the center sill on top the cover plate and the end sill. The connection to the side sill is made through a clip angle riveted to the diagonal brace. The coping angle is a 4″ by 3½″ by ⅜″ bulb angle running the full length of the car. The side sheets are ¼″ plate. The end side sheets are 3/16″ pressed to a taper to accommodate the side ladders, the construction of which is in accordance with the Pilcher patent owned by the Wine Railway Appliance Co.

The side sheets and side stakes are pressed inward at the top with cast stiffeners on the outside opposite the stake connections. This gives a self-clearing feature when the car is unloaded in a dumping machine. The end sills are 6″ by 3½″ by ⅜″ angle. The corner posts are 3½″ by 3½″ by ¼″ angle. The end posts are 3½″ by 3″ by ⅜″ angles which tie into the striking casting at the center sills, and are so arranged as to tie in the end of the center sill with the end construction of the car, thereby eliminating sagging at this point. A short and intermediate post of the same size angle is used to support the brake step which is arranged for the Perfection brake ratchet and Interlox shaft ratchet.

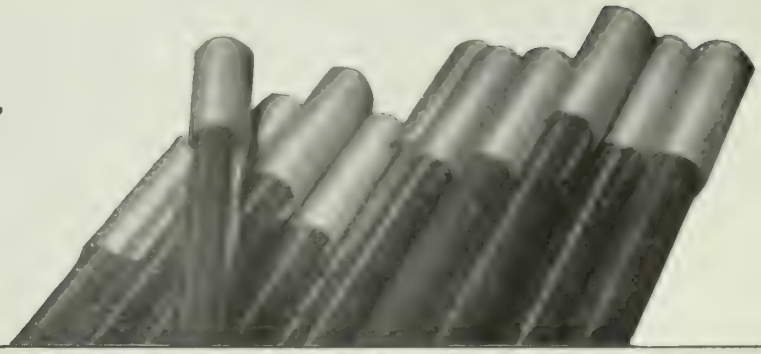
The car is equipped with the National M-17 friction draft gear. The standard A. R. A. back stop casting is used. The rotary operating type "D" Coupler is used on the "A" end of the car, 6″ by 8″ shank with the vertical cast steel yoke. The coupler in the "B" end of the car is the Rotary Operating Buckeye-Goodwin Swivel Butt 6″ by 8″ shank and Key equalizer used with vertical cast steel yoke. Both couplers have 11″ knuckles and have the bottom Rotary Operating release rigging. The draft keys used are 6″ by 1½″ round edge with Buffalo draft key lock. The truck side bearings are the Wine heavy duty Bull Dog Bearings. This bearing has unlimited travel, is self-centering and is designed particularly for the 70-ton car. The car superstructure is mounted on Dalman trucks 5′ 8″ wheel base mounted at 29′ 0″ truck centers. The "B" end of the car is equipped with the standard Dalman. Under the "A" end of the car is the Dalman improved Q. W. C. truck with cast steel spring plank which enables changing of wheels by removing nothing but the brace and wedges and lifting off the side frames.

Another feature is that of changing the design to a 57½-ton capacity by omitting one hopper section through the car. This does not change rivet spacings in the connections. It means only shortening the through members by 6′ 4″. The 57½-ton car has an inside length of 31′ 8″ and a cubic capacity of 2222 cu. ft. when level full.

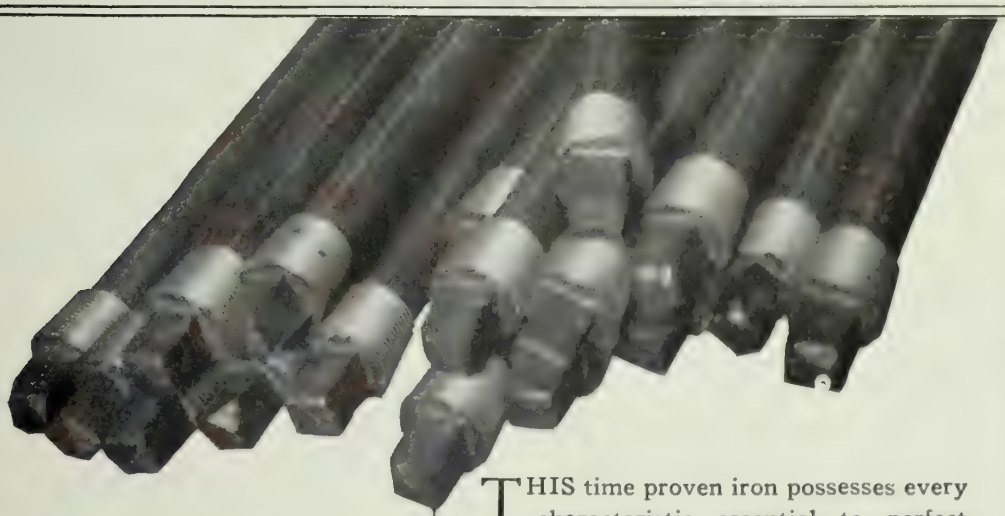
Among the specialties on the car are: Cast steel truck bolsters, side frames, spring plank, draw bar yokes, couplers, bolster center braces and body center plates by the Buckeye Steel Castings Co.; wheels and axles by the Carnegie Steel Co.; Metal Compensating Dust Guards by the Harrison Dust Guard Co.; Ajax corrugated hopper doors, coupler centering device and striking casting and bottom rotary operating coupler release rigging by the Union Metal Products Co.; truck levers, bottom connections, brake hangers and clevises by the Schaefer Equipment Co.; Hannaford angle cock holder and Sambo hand brake by the Car Devices Co.; brake beams, safety supports, brake shoe keys, self locking brake pins and draft key locks by the Buffalo Brake Beam Co.; Perfection brake ratchet and Interlox brake shaft ratchet and retainer valve holder by the Railway Devices Co.; draft gear by the National Malleable and Steel Castings Co.; Duco finish all over by the DuPont de Nemours Co.; safety ladders, Bull Dog truck side bearings, and drop door locks by the Wine Railway Appliance Co.; Capital Waste Retainers Allegheny Steel Co.; Hoodless self-fitting torsion spring journal box lids on Q. W. C. truck; Standard Dalman truck equipped with Railway Steel Spring Co.'s non-hood journal box lids with pin retainers.

The increase in the use of electricity continues uninterruptedly. Nearly eight billion kilowatt-hours were produced last year. Of this stupendous production, 37.1 per cent was generated by water power and 62.9 per cent by fuel power, which is identical with the figures of 1920, when the ratio stood 37.1 water and 62.9 fuel.

"In Use Since 1844"



TENNESSEE CHARCOAL BLOOM STAYBOLT IRON



THIS time proven iron possesses every characteristic essential to perfect staybolt performance. It consistently delivers maximum efficiency at minimum maintenance.

Soft, ductile and tough, it is uniform and unvarying in its high quality and conclusively demonstrates that in the end the best staybolt iron is always the cheapest.

A thorough service trial will be convincing.

EWALD IRON COMPANY
LOUISVILLE

CHICAGO NEW YORK ST. PAUL

(Continued from Page 16)

true of the alloy steel tonnage which has increased in this time more than 500 per cent, from a few thousand tons in 1909 to more than 25 million tons a year. In this period the automobile has been developed to a point extremely agitating to the railroads. The alloy steel industry and the automobile have been largely dependent on each other because only through the use of that kind of steel has it been possible for the automobile to reach its present high efficiency and economy of operation.

The latest arrival in the field of transportation — the airplane — is also dependent upon alloy steels. And now the older means of getting about rapidly, the railroads, have turned wisely and extensively to the use of alloy steel for locomotive forgings and castings in order to meet the requirements imposed by increasing size and power.

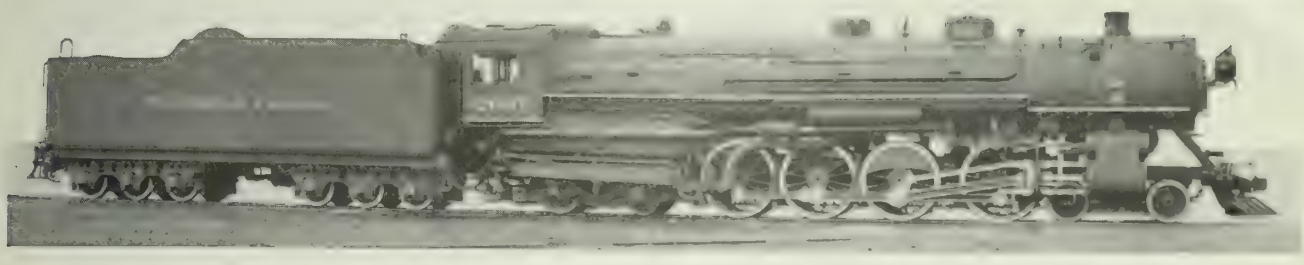
Of the various metals used in producing alloy steels none has played a more important part than this semi-rare metal. History says it was originally discovered about a hundred years ago in some of the brown lead ores of Mexico, probably about 1804, but the presence of such an element was discredited for another quarter of a century. About this time a Swedish scientist, Sefstrom, investigating the iron ores in Taberg, Sweden, from which a remarkably soft and ductile iron had been produced, disclosed a new element in the mineral and called it vanadium, which gets us back to the promise made in the beginning of this tale. For a while it was thought that the name was in honor of Vanadis, the principal goddess of Scandinavian mythology. The latest version is that the name vanadium is derived from Vanir, the name of two stocks into which the gods of Norse mythology were divided.

For half a century, no practical use was made of this element because of its rarity, for while the metal has been widely distributed, it invariably has occurred in small quantities. It is frequently found in lead, copper, zinc, uranium and iron ores as well as in clays and in shales. Practically all American magnetites and secondary iron ores contain small amounts. In 1900, Prof. Arnold, of Sheffield, a well-known English metallurgist, made a series of tests to investigate the effect of vanadium on steel. These tests were made with simple carbon tool steels. The addition of vanadium, it was found, raised the elastic limit 40 to nearly 100 per cent and increased the tensile strength 10 to 60 per cent without materially affecting the ductility of the steel. It was not until 1905, however, that the world's richest deposits of the ore were discovered in the Peruvian Andes, and these eventually became the property of the American Vanadium Co., of Pittsburgh largely as described, through the efforts of Joseph Flannery. The work of getting out the ore is done by native hand labor accustomed to the rare atmosphere of mines almost at the summit of the Andes, 16,200 feet above sea level. For a long time this ore was taken from Mina Ragra, the name of the mines, to Lake Pun Ruyn, six miles away, on llamas, the native beasts of burden, and there transferred to boats for delivery to the Peru Central Railway, 28 miles distant. Now the company uses trucks instead of railroad cars and handles the ore more cheaply and quickly.

Llamas, the First Means of Getting the Ore to the Coast, Could not Be Overloaded—Not One Pound.

Joseph Flannery has gone. He died in 1920. What he did in his life is worth passing on to the coming youth many of whom believe the period of opportunity for those of limited means has passed. He possessed in a rare degree a constructive genius and a passion for discovering new ways, new methods. He created new industries that made others rich but in doing it he found things that benefited the world far more than wealth could do. "He created opportunities," said the Pittsburgh Post when he died, "and such a man can not be cited too often to young men who talk of being discouraged."

And the Frenchman in the first paragraph, Narcisse Helouis, he who taught his countrymen to use vanadium? Science brought him no wealth and little fame. Watched by his friends he drifts along, browsing among his solemn books, forgotten by those he helped the most, finding his chief joy no doubt, as old men do, in memories of the past.



ON THE 4-8-4

THIS large and powerful locomotive is the Northern Pacific 4-8-4—another achievement in a distinctive design of locomotive of which the cylinder wearing parts are made of HUNT-SPILLER GUN IRON to insure low fuel consumption and maintenance costs.

It is significant that HUNT-SPILLER GUN IRON cylinder bushings, valve bushings, cylinder packing rings, valve packing rings and cross-head shoes were specified for these highly efficient locomotives that are now showing the way to greater operating economies.

Wherever wear is the problem HUNT-SPILLER GUN IRON is the solution.

Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Outer Bushings for Floating Rod Application

HUNT-SPILLER MFG. CORPORATION

J. G. Platt, Pres. & Gen. Mgr. V. W. Ellet, Vice-President

Office & Works

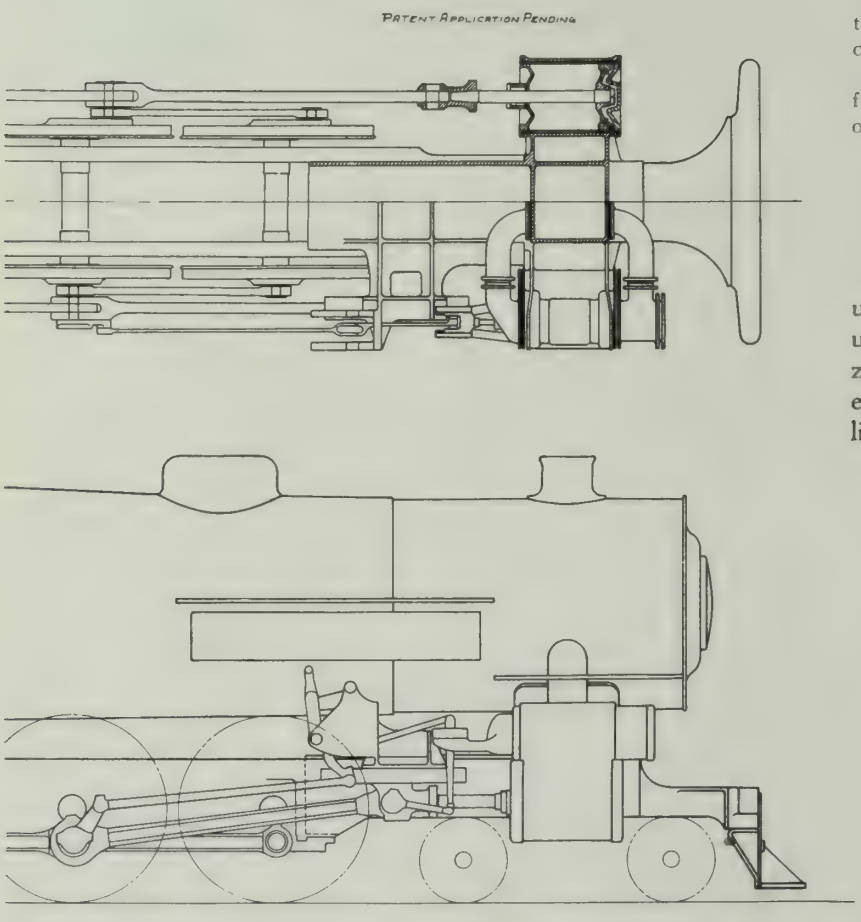
383 Dorchester Ave. South Boston, 27, Mass.

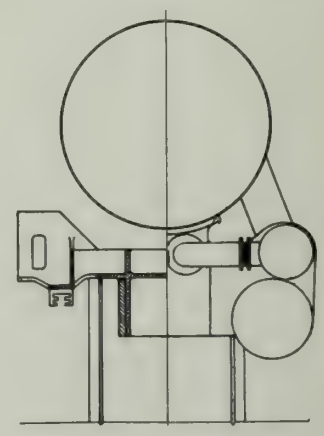
Canadian Representative: Canuck Supply Co., Ltd., 371 Aqueduct Street, Montreal, P. Q.
Export Department: International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER
GUN IRON

Insures Bigger Earnings From Every Locomotive

UNITARY ENGINE MACHINERY SUPPORT—CYLINDERS CAST INTEGRAL





Slide No. 4.

(Continued from Page 28)

will evaporate), shows the water costs 4.6 per cent of the coal costs.

The latter percentage is higher than in the former example, caused by difference in evaporative efficiency of the two locomotives. Where the feed water heater is used there is a higher evaporation per pound of coal, or a similar evaporation with less coal, or both. Water cost will be higher as evaporation is increased while coal cost is diminished due to the better efficiency mentioned.

Since there is such a variance in the costs at different tanks, there may be an opportunity to effect considerable saving where it may be possible to figure out from actual operation at which tanks locomotives can take full tank of water where it is cheaper, and at which tanks they can take it more sparingly, or possibly run a tank altogether where water cost is high priced. In making these calculations it should be remembered that it costs something to make an additional stop and start with trains, and this cost varies according to whether the start is made on level track, ascending or descending grade, or if engine can cut off from the train on the main line before reaching the tank, so that when starting the train, it is possible to overcome any grade resistance, etc. which would have to be contended with if the stop were made at the tank with the train.

The out-of-pocket, or direct costs, to make an additional stop and start by trains on level straight track summer conditions are about as follows:

11 cars, Pacific type locomotive, passenger train $0.50.

50 loaded car 2-8-2 Type Loco. freight train not on overtime 90 cents; if on overtime $1.70.

80 loaded cars 2-10-2 Type locomotive, freight train not on overtime $1.44; if on overtime $2.30.

Many a True Word Spoken in Jest

Although the airplane was first used for carrying mail in 1918, its use was suggested by a kindly citizen of Pennsylvania in 1822. The editor of Freeman's Journal, published in Norristown, Pa., made this prophetic suggestion to Postmaster General McLean:

"We would advise the postmaster general to avail himself of the novel and very ingenious flying machine made by James Bennett, of Philadelphia, by which, we conceive the mails could be transported with more celerity and their arrival at the places of destination be much more certain than is the case at present."

It is quite probable that the editor of Freeman's Journal wrote this with a humorous twinkle in his eye, never realizing that in a little less than one hundred years his suggestion would be safely put into practice by our postoffice department.

The Milk Train

carrier of good health

2,750,000 quarts of milk, New York City's daily supply, is brought in every night by the railroads from an average distance of 200 miles. Much of it travels 500 miles. Yet New York is reputed to have a purer milk supply than any other city in the world.

Recently a milk tank-car, carrying 12,000 quarts of fresh milk in two large glass-lined tanks, ran from Wisconsin to Florida, a distance of 1,800 miles, in 101 hours. With a change of temperature of 68 degrees outside, the temperature of the milk rose only one degree.

Such efficiency by the railroads in the transportation of food supplies has contributed greatly to the nation's health.

By supplying the oxwelding needs of railroads controlling a majority of the trackage in the country, the Oxweld Railroad Service Company has had a part in the development of modern railroading. Fifteen years of service has proved the value of an Oxweld Railroad Service contract.

OXWELD
RAILROAD SERVICE

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
New York City: Carbide and Carbon Building
Chicago: Railway Exchange

The News of the Month

What's Been Going on in Transportation, Railroads, Automotive, Supply, Aviation

EVERYONE and everything seems to be hastening along rather more rapidly than anyone ever expected to experience. Hours and even the days are being lopped here and there so liberally that some difficulty is found in keeping trace of the changes. Airplanes on regular daily service have established a three-hour service between Los Angeles and San Francisco; air and rail service of 48 hours between New York and Los Angeles is announced for some time this summer; another company is to put scenic air and rail service between Chicago and Los Angeles—36 hours for the trip—in July, and now the three principal transcontinental lines are out with a cut in the freight schedule.

Chicago and all eastern territory having through carload or less than carload shipments will be brought one day closer to Los Angeles and other California points by a speeding up of freight service, according to joint announcement made by the Santa Fe, the Union Pacific and the Southern Pacific railroads.

Under the new schedules freight from Chicago for this territory will be delivered on the eighth morning instead of the ninth morning, as heretofore.

Through shipments of merchandise and other commodities from points east of Chicago are included in the new schedule, thus making it possible for merchants, manufacturers, wholesale dealers, jobbers and brokers to better serve their customers, and insure delivery that will effect a great savings in the handling of stocks.

Short Lines Meet in Mexico

The American Short Line Railroad Association, represented by about a hundred members, had a combination outing, sight-seeing journey and incidentally its sixteenth annual meeting May 10 in the City of Mexico. This was the first time the organization ever has assembled outside the United States. Many of the members had their families, or part of them at least, with them on the trip so that in all the party numbered nearly 200. The Mexican government, which had cooperated generously for months in arranging the meeting in the nation's capital city, had the party taken over the national railway lines to Toluca and over another section to Vera Cruz and Puebla.

Bird M. Robinson was re-elected president in the concluding session; B. B. Cain, vice president and general counsel; L. S. Cass, vice president, and T. F. Whittelsey, secretary-treasurer.

H. W. Johnson Heads the Accountants

The Railway Accounting Officers' Association elected H. W. Johnson, of Chicago, as its president for the coming year and selected Cleveland, Ohio, as the site of the 1929 convention in the annual meeting at Atlanta early in May. Other officers elected were: T. O. Edwards, San Francisco, first vice president; W. E. Ettler, New York, second vice president, while E. R. Woodson, of Washington, D. C., was reelected secretary. J. J. Ekin, Baltimore; H. S. Palmer, New Haven, Conn., and W. C. Wishart, New York, were named on the executive committee.

Revenue Freight Passes a Million

Loading of revenue freight during the week ended on May 19, exceeded the million car mark for the second consecutive week so far this year, the car service division of the American Railway Association has announced. Total loadings for that week numbered 1,003,497 cars.

Compared with the preceding week, this was an increase of 1,514 cars, due principally to the heavier movement of ore although there was also an increase in the number of cars loaded with forest products and merchandise less than carload lot freight. Decreases compared with the week before were reported in the total loading of all other commodities.

The total for the week of May 19 was a decrease, however, of 24,001 cars below the same week in 1927 as well as a decrease of 35,573 cars compared with the corresponding week two years ago.

Miscellaneous freight loadings for the week totaled 394,656 cars, an increase of 1,759 cars above the corresponding week last year and 4,187 cars above the same week in 1926.

Coal loading totaled 153,300 cars, a decrease of 8,009 cars below the same week in 1927 and 11,918 cars below the same period two years ago.

Grain and grain products loading amounted to 38,357 cars, a decrease of fifty-one cars under the same week last year and 1,276 cars below the same week in 1926. In the western districts alone, grain and grain products loading totaled 24,572 cars, an increase of 1,225 cars above the same week in 1927.

Live stock loading amounted to 25,246 cars, a decrease of 3,139 cars below the same week last year and 1,640 cars below the same week in 1926. In the western districts alone, live stock loading totaled 19,548 cars, a decrease of 1,891 cars compared with the same week in 1927.

Esch's Place Is Filled

Patrick J. Farrell of the District of Columbia was nominated by President Coolidge May 17 to be a member of the Interstate Commerce Commission, succeeding John J. Esch of Wisconsin.

The appointment brings to an end the president's effort to retain Esch on the commission. The senate refused to confirm Esch's nomination last December, whereupon Mr. Coolidge gave him a recess appointment under which he has served until this time.

Farrell now is chief counsel for the commission. He formerly was a member of the Democratic state committee of Vermont and a delegate to the Democratic national convention in 1896. He was born in Quebec.

The B & M Dedicates Boston Hump Yards

A gathering of 1750 persons, including public officials, business executives, industrial leaders, traffic managers and railroad heads from all parts of New England and beyond, assembled June 5, at luncheon exercises with which the Boston & Maine's new Boston freight classification yards were dedicated and formally opened.

Interest in these $4,000,000 "speed yards," with their electro-pneumatic car retarders and other mechanical devices, the invention of President George Hannauer, to expedite the sorting and switching of 1,000,000 freight cars a year in and out of Boston, brought together one of the largest gatherings of its kind in the history of railroading. Luncheon was served the guests in a vast pavilion tent pitched on the top of Asylum Hill, overlooking all the Boston & Maine's terminal area. Here, as a brief preliminary to the exercises of dedication

The BARBER Lateral Motion Device

is less expensive than swing hangers and has no dangerous wearing parts. Under fair usage it will last the life of the car itself

Illustration shows small number of pieces in excess of those required in a rigid truck.

It will earn its cost in a few thousand miles

The Barber Lateral Motion device is the only simple and practical substitute for "swing hangers."

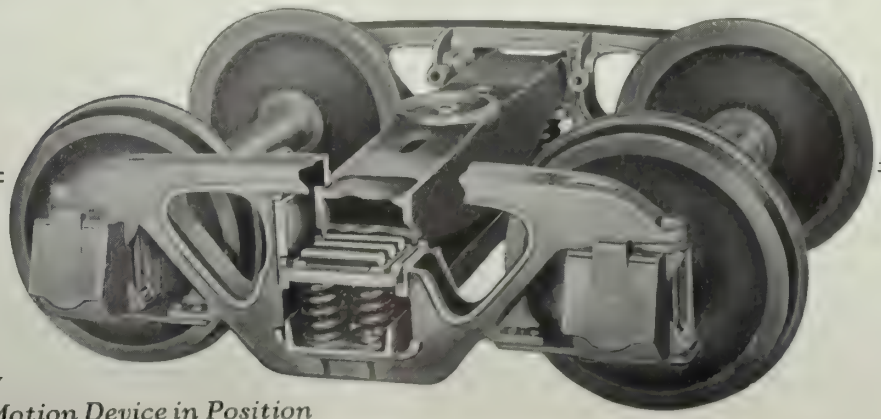
All passenger car trucks are equipped with lateral motion through some type of swing hanger. At one time swing hangers were extensively used on freight car trucks, but were discontinued because excessive wear soon put them in a dangerous condition. A defective hanger in a moving truck nearly always resulted in a serious wreck.

The Barber Lateral Motion Device eliminates the danger element and the consequent dissatisfaction. It provides the means of giving freight car trucks the same easy riding quality so much desired in passenger equipment, and as a result decreases wear and tear on rolling stock, delays, accidents and actual money losses which usually follow in the wake of wrecks and tie-ups.

The difference between the cost of a rigid truck and one equipped with the Barber Lateral Motion Device is so small, that the resultant saving in continuous car service will pay for the device in a short time.

CONSIDER—It is impossible to run a passenger car without lateral motion—
why run a freight car without it ?

Standard Car Truck Co., 1322 McCormick Bldg., Chicago



Truck Cut Away
Showing Lateral Motion Device in Position

and demonstration, greetings were exchanged between President Hannauer of the Boston & Maine, Speaker John C. Hull, representing Governor Fuller of Massachusetts, and W. F. Garcelon, chairman of the New England Shippers Advisory Board, as spokesman for the shippers of New England. The toastmaster, or "yardmaster," was Vice President N. W. Hawkes of the Boston & Maine. A "Parade of the Box Cars" provided a bit of pageantry in connection with the after-luncheon exercises. The gathering then went to a grand stand erected at the Somerville end of the inbound yards, where the guests saw in "close-up" the processes under which freight cars from all parts of the country, after being pushed over the hump by husky switching engines and uncoupled by the yard conductor, rolled down the sloping tracks, their momentum controlled by the squeezing retarders, their direction guided by power-thrown switches, and grouped by 28 destinations as they were sorted into trains by an unseen hand. The familiar figure of the brakeman on top of freight cars was missing, being substituted by the retarders.

Railway Construction

Tracks and Yards

ILLINOIS.—The Alton & Southern is constructing a $40,000 addition to the Davis yard at East St. Louis.

MICHIGAN.—The Pere Marquette has asked the I. C. C. for permission to construct a 30-mile line from Pontiac to Richmond and an 8-mile line from Green Oak to Wixom.

PENNSYLVANIA.—The Bessemer & Lake Erie, it is reported, plans change of line and grade reduction at Harrisville to cost about $150,000. An additional $1,121,000 is being spent in completing changes and reductions of grade on the Filer to Coolspring line.

SOUTH CAROLINA.—The Atlantic & Western has asked the I. C. C. for permission to build a new 50-mile line from Mt. Pleasant to Jamestown.

SOUTH DAKOTA.—The Mound City & Eastern will construct 65 miles of line between Mound City and Leola to cost about $12,000 a mile, it is reported.

TEXAS.—The Rock Island has applied to the I. C. C. for authority to issue $108,000 capital stock, the proceeds to be used in building a 34-mile line from Spinnett to Gruver.

Buildings and Structures

CONNECTICUT.—Danbury. The New Haven has awarded a contract to the Roberts & Schaefer Co. for an N. & W. type electric cinder plant to be built here.

—New Haven. Three fireproof sand towers for electric locomotives are to be built at the Cedar Hill yard here for the New Haven by the Roberts & Schaefer Co.

ILLINOIS.—Chicago. The C. B & Q. has let a contract to T. S. Leake Construction Co., for three cinder pits, two inspection pits and seven wash tables at Western ave. and Sixteenth st.

—Evanston. The Milwaukee is planning the elevation of its line between Church and Central sts. at a cost of about $2,500,000.

—Galesburg. The Santa Fe has let a contract to Fairbanks, Morse & Co., Chicago, for a 500-ton four-track reinforced concrete coaling station, automobile type, operated by an electric motor and equipped with scales for weighing coal.

—Lake Villa. The Soo Line will construct a 200-ton coaling station here, the contract going to Fairbanks, Morse & Co., Chicago.

—Schiller Park. Fairbanks, Morse & Co. has a contract for a 200-ton coaling station and a cinder conveyor for the Soo Line.

KANSAS.—Marysville. The Union Pacific is receiving bids for a 166 by 38 ft. one-story brick and terra cotta passenger station to cost about $135,000, it is reported.

—Topeka. The Santa Fe, the Missouri Pacific and this city will build a viaduct over the tracks of the two railroad companies at Sixth ave. to cost about $500,000. It will be 1,479 ft. long with a 36-ft. highway and two 5-ft. sidewalks.

MARYLAND.—Cumberland. It is reported the Baltimore & Ohio has awarded Bickelhaupt, Inc., Richmond, Va. a contract for a water treating plant to cost about $85,000.

MASSACHUSETTS. — Boston. The contract for the first work on a $320,000 brick building at the Fargo street yards has been let to the Tredennick-Billings Co., Boston, by the New Haven. The first floor is to be used for handling produce and the second for offices.

MISSOURI.—St. Louis. The Frisco will construct a street subway under the railroad tracks at Wellington ave. it is reported. The total cost of about $149,000 will be shared by the city.

—St. Louis. Plans have been announced by the Terminal Railroad Assn. for enlarging the Union Station, increasing the capacity of the passenger, mail, baggage and express facilities about 60 per cent, at a cost of several million dollars.

NEBRASKA.—Gering. The Union Pacific will construct a coaling station here; contract for material and equipment has been let to T. W. Snow Construction Co., Chicago.

—Omaha. The Union Pacific is reported to be planning a 12-story addition to its building at Fifteenth and Capitol, to have outside dimensions of 94 by 60 ft. and to be of steel, concrete and tile, with exterior to match the present structure.

NEW JERSEY.—Greenville. The Pennsylvania has let a contract to the Bethlehem Steel Co. for a lift bridge and two approach spans for the Newark Bay bridge.

NEW YORK.—Buffalo. The New York Central has awarded a contract to the Turner Construction Co. for a two-story express building at the Curtis street terminal, the outside dimensions of which will be 60 by 300 ft.

—Oak Point. The New Haven has awarded a contract to the Roberts & Schaefer Co. for two fireproof sand storage towers for electric locomotives.

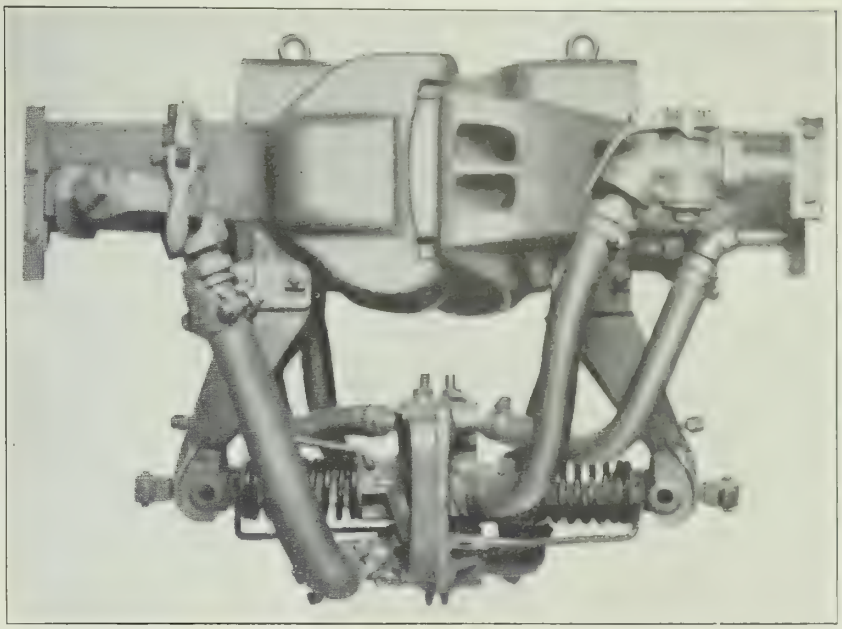
OKLAHOMA.—Oklahoma City. The Rock Island has been authorized by the I. C. C. to construct a new passenger station here to cost about $5,000,000 and to be used jointly by this line and the Frisco. About seven miles of new main line track will be built to serve the station and connect with the present line at an approximate cost of $2,000,000.

PENNSYLVANIA.—New Brighton. The Pennsylvania has let a contract to W. F. Trimble & Sons Co., Pittsburgh, for concrete paving on Fifth ave.

—Pittsburgh. The Pennsylvania plans freight and produce terminal between Eleventh and Twenty-fourth sts. along the Allegheny River to cost about $5,000,000.

WYOMING.—Torrington. The C. B. & Q. will build a $30,000 brick and concrete freight and passenger station. The contract has been let to Charles Hollingworth, Torrington.

—Yoder. The Union Pacific has awarded a contract for the material and equipment for a 50-ton capacity coaling station here to T. W. Snow Construction Co., Chicago.



The AMERICAN AUTOMATIC CONNECTOR is the only automatic hose coupler in existence with a ten year continuous service record behind it.

There are thousands of AMERICAN AUTOMATIC CONNECTORS in successful operation today—more than have ever been in service before.

The AMERICAN AUTOMATIC CONNECTOR is built on scientific principles and is the result of many years' development work.

It is reliable in every respect.

Every dollar invested in AMERICAN AUTOMATIC CONNECTORS is a dollar put to work to earn dividends.

Write us for any information desired.

We are prepared to make immediate installations, large or small, in any part of the country.

See our Exhibit at the Atlantic City Convention.

THE CONSOLIDATED CONNECTOR CORPORATION

118 Noble Court **Cleveland, Ohio**

Locomotive Orders

According to the A. R. A. Class 1 railroads, in the first four months this year, installed 561 locomotives. Compared with the corresponding period last year, this was a decrease of 73, and a decrease of 198 compared with the same period in 1926. Locomotives on order May 1 this year totaled 137 compared with 217 on the same date last year.

The outstanding order of the month is that of the Erie, placed with Baldwin, for 35 2-8-4 locomotives. Baldwin also received orders for 10 4-8-4 locomotives from the Ferrocarril de Pacifico (Colombia), four Mikados from Ferrocarril de Antioquia (Colombia), one switcher from Indianapolis Union, and one 2-6-6-2 from the Weyerhaeuser Timber Co. The Missouri Pacific ordered five 2-8-4 locomotives from the American Locomotive Co.; the Chicago, South Shore & South Bend, two electric locomotives from Baldwin and Westinghouse and the Ashland division of the American Rolling Mill Co., three oil-electric locomotives from Ingersoll-Rand Co., General Electric Co., and American Locomotive Co. The Mississippi Central is inquiring for one Mikado and the Boston & Maine for two switchers.

Passenger Car Orders

The outstanding orders of the month were those of the Southern Pacific for six baggage and mail cars placed with the Bethlehem Steel Co., 10 baggage cars with Standard Steel Co., 25 coaches with American Car & Foundry Co., five compartment coaches and six dining cars with the Pullman Car & Mfg. Corpn., and the Erie for 25 suburban passenger cars placed with Standard Steel Car Co., five baggage and express cars and three baggage and mail cars with Pullman Car & Mfg. Corpn. The American Car & Foundry Co., received orders for 10 combination baggage and mail cars from the Baltimore & Ohio; eight sleeping cars, two buffet baggage cars and ten passenger cars from the Central Railway of Brazil; five horse cars from the Rock Island; and 23 trucks for motor cars (subway) from the Interborough Rapid Transit Co., New York. The Chicago, South Shore and South Bend ordered ten rail motor cars from Standard Steel Car Co.; the Northern Pacific, one rail motor car from J. G. Brill Co.; and three rail motor cars from Standard Steel Car Co.; Burlington, ten gas electric cars from Pullman Car & Mfg. Corpn., and Electro-Motive Co.; Lehigh & Hudson, one gas electric car from J. G. Brill Co. The Cincinnati Street Railway ordered 100 electric cars from the Cincinnati Car Co., and the Milwaukee is building ten baggage cars in its own shops. The Northwestern Pacific is inquiring for one to seven passenger and baggage gas electric cars, the Missouri Pacific for one business car, and the Southern Pacific for ten street cars.

Freight Car Orders

Freight cars placed in service in the first four months of 1928 by the Class 1 railroads, according to reports filed with the A. R. A. totaled 15,635, a decrease of 6,431 compared with the corresponding period last year and a decrease of 16,345 compared with the same period in 1926. Freight cars installed in April this year totaled 5,571 compared with 6,270 in April, 1927. The railroads on May 1 had 22,242 freight cars on order compared with 26,675 on the same date last year and 48,762 in 1926.

Our records show the following orders placed during the past month: Chicago & North Western, 300 gondolas with Standard Steel Car Co.; Barrett Co., 100 insulated tank cars with American Car & Foundry Co.; Hainesport Mining & Transportation Co., four hopper cars with American Car & Foundry Co.; Guayaquil & Quito, Ecuador, 50 box cars with American Car & Foundry Co.; International Railways of Central America, 25 flat cars, 50 gondola cars and five tank cars with Magor Car Corpn.; Virginian Railway, 1000 hopper car bodies; Frisco, 250 underframes with the Virginia Bridge & Iron Co. It is reported the North American Car Co. has purchased 500 used tank cars, the name of the seller being unknown. The North American Car Co. is also inquiring for 50 to 100 underframes; the Wheeling Steel Corpn., 10 gondola cars and 20 hopper cars; Iquique a Pintados (Chile), 10 air dump cars. The Seaboard Air Line is converting 500 flat bottom gondola cars to drop bottom gondola cars and the Boston & Maine is making repairs to a number of freight cars.

Bus and Truck Orders

Twin Coach Corpn., reports the following orders and deliveries: Purple Stages Inc., Pittsburgh, ten parlor coaches; West Texas Coaches, Fort Worth, two parlor coaches; Hamilton-Oxford Bus Co., Hamilton, Ohio, one parlor coach; Egyptian Transportation System, two parlor coaches; Motor Transit Management Co., Chicago, six parlor coaches; Winnipeg Electric Co., two urban coaches; Detroit Motorbus Co., two urban coaches; Los Angeles Railway Corpn., four urban coaches and one parlor coach; St. Louis Public Service Co., six urban coaches; North Coast Transportation Co., Tacoma, two parlor coaches; Pittsburgh Motor Coach Co., seven suburban express type coaches; Cincinnati Street Railway, eight Twin coaches; Northern Ohio Power & Light Co., Akron, 15 Twin coaches and one gas-electric urban coach. It is reported that the Boston Elevated will purchase ten gas-electric buses from Twin Coach, eleven gas-electric from American Car & Foundry Motors Co., and seven gas-electric from the Versare Corpn., all to be equipped by the General Electric Co. The Southern Pacific Transportation Co., has purchased one Yellow type-Y coach; the Reading Transportation Co., four White model-75 club coaches; Illinois Power & Light Corpn., four Yellow 21 passenger city type buses; Brooklyn City Railroad, four White model 50-B buses; Eastern Texas Electric Co., Beaumont, three Reo passenger buses with observation type Fitz-John bodies; San Antonio Public Service Co., one Studebaker 21 passenger street car type. It is reported that the Montreal Tramways plans to purchase during 1926 58 buses of the 37 passenger type, the bodies to be constructed of duralumin and steel.

Changes in Personnel

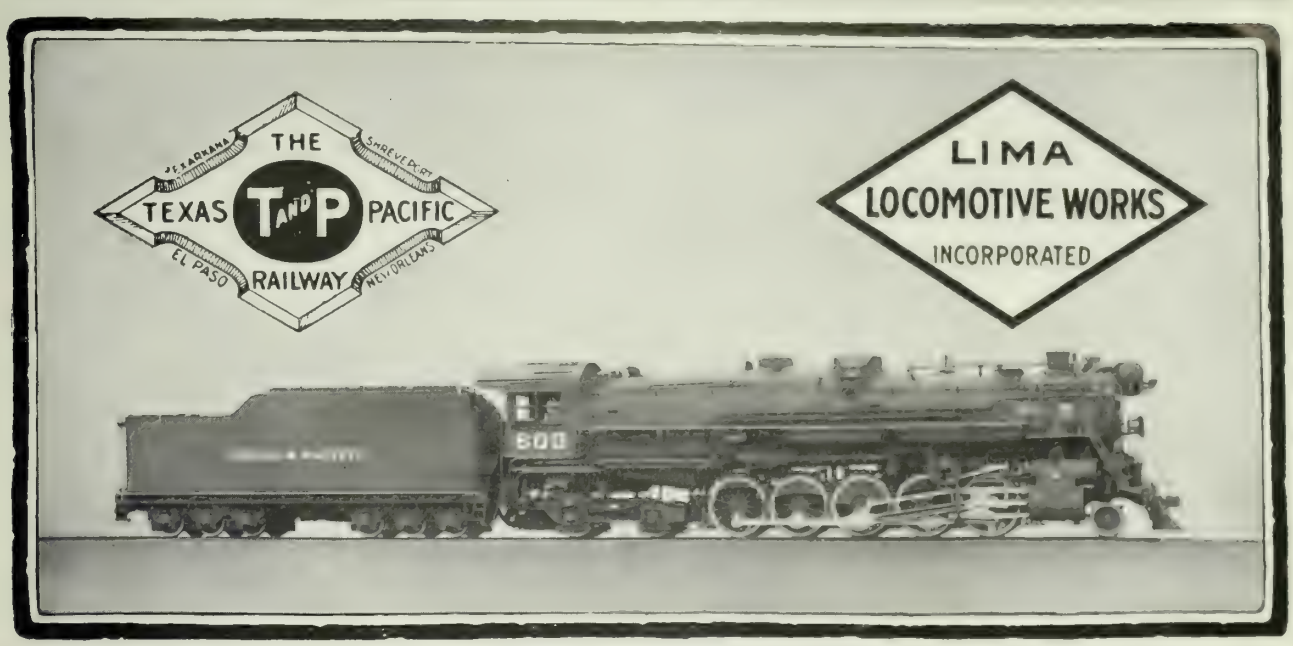
Executive and Operating

John R. Henning has been elected a director of the Buffalo, Rochester & Pittsburgh to succeed **Samuel Woolverton,** resigned.

A. B. Huttig, formerly employed in the New York office of the Illinois Central, has been named assistant secretary, and will be in charge of the transfer and registration of stocks, a post created for him. Headquarters, Central Station Bldg., Chicago.

Lawrence M. Paxton, traffic manager of the Denver Union Stock Yards, has been elected vice president of the Oklahoma City Junction Ry. and the Oklahoma City Stock Yards Co., with headquarters at Oklahoma City.

The Canadian Pacific announces that **J. A. Brass,** chief clerk to the vice



One of the forty "Texas" (2-10-4) type locomotives built for The Texas & Pacific Railway by Lima Locomotive Works, Incorporated

On the "Texas" Type Locomotives • •
Vanadium Forgings and Castings

On the "Texas" (2-10-4) Type—

Carbon-Vanadium Forgings

Front Crank Pins
Back Crank Pins
Back Intermediate Crank Pins
Main Crank Pins
Crosshead Keys
Eccentric Cranks
Piston Rods
Knuckle Pins
Transverse Equalizers
Front Equalizers
Main Rods
Front Rods
Back Rods
Back Main Rods
Back Intermediate Rods

Vanadium Steel Castings

Main Engine Frames
Crossheads
Driving Boxes

THE "Texas" (2-10-4) type locomotives of The Texas & Pacific Railway, incorporating a number of improvements in design, represent another step forward in locomotive development.

Like practically all improved locomotives produced in recent years, the "Texas" type locomotives are equipped with Carbon-Vanadium Steel in important forgings and Vanadium Cast Steel in main engine frames, crossheads and driving boxes.

Thus the designers provided the "Texas" type locomotives with forgings and castings as modern in design and material as is every other item entering the construction of these super-power steam locomotives.

Data on interesting locomotive applications of Carbon-Vanadium Forging Steel and Vanadium Cast Steel is available. Write for it.

VANADIUM CORPORATION OF AMERICA

Chicago — Straus Bldg.
New York — 120 Broadway
Detroit — Book Bldg.

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories at Bridgeville, Pa.

VANADIUM STEELS

for strength, toughness and durability

R. E. Kelly

president of the western lines at Winnipeg, has been promoted to assistant superintendent in the Saskatchewan district with headquarters at Wilkie, Sask.

The Katy announces these changes: **J. H. Little**, district superintendent with headquarters at Smithville, Tex., transferred to Parsons, Kans., succeeding **S. B. Moore**, deceased. **D. C. Dobbins**, district superintendent with headquarters at Wichita Falls has been transferred to Smithville to succeed Mr. Little. **T. F. Gardner**, trainmaster of the Osage and Oklahoma divisions of the Parsons district, with headquarters at Parsons will succeed Mr. Dobbins at Wichita Falls as superintendent of the northwestern district.

Frederick J. Fisher, vice president of the General Motors Corpn., has been elected director of the Michigan Central to fill the vacancy caused by the death of **Chauncey M. Depew.**

E. D. Stair of Detroit has been elected a director of the Wabash to succeed **Alvin W. Krech**, deceased.

John Ringling, of Sarasota, Fla., and **Clarke G. Dailey** have been elected directors of the Seaboard Air Line.

The Pennsylvania has organized, effective May 16, two general divisions in the western region each to be under the charge of a general superintendent. The western region embraces the lines west of Columbus and included nine divisions, each headed by a superintendent. Under the new organization these divisions are grouped into two general divisions; the northwestern general division, with headquarters at Chicago, including the Chicago terminal, Ft. Wayne, Logansport, Toledo and Grand Rapids divisions, and the southwestern general division, with headquarters at Indianapolis, including the Columbus, Cincinnati, St. Louis and Indianapolis divisions. These appointments followed the change in organization: **W. C. Higginbottom**, general superintendent of transportation of the western region, with offices at Chicago, has been made general superintendent of the northwestern division; and **C. E. Whitlock**, superintendent of the Pittsburgh division of the central region, has been made general superintendent of the southwestern division. **E. W. Perrott**, assistant general superintendent of transportation, western region, has been appointed superintendent of freight transportation, western region. **J. M. Symes**, chief clerk to the general manager, western region, has been appointed superintendent of passenger transportation, western region. **H. H. Haupt**, master mechanic at Wilmington, Del., eastern region, has been appointed superintendent of motive power, northwestern division. **G. B. Fravel**, assistant general superintendent of motive power, western region, has been named superintendent of motive power, southwestern division. **W. S. Johns, Jr.**, engineer, maintenance of way of the western region, has been appointed engineer of maintenance of way of the northwestern division and **R. H. Pinkham**, superintendent, Fort Wayne division, has been appointed engineer of maintenance of way of the southwestern division. **J. C. Rill**, superintendent, Logansport division, has been transferred to superintendent of the Columbus division vice **J. A. Appleton**, who has been named superintendent of the Pittsburgh division succeeding Mr. Whitlock. **J. G. Sheaffer**, superintendent, Delaware division, has been appointed superintendent of the Fort Wayne division, vice Mr. Pinkham. **H. A. Hobson**, assistant superintendent, New York division, has been appointed superintendent of the Logansport division vice Mr. Rill. **R. P. Graham**, division engineer of the middle division, eastern region, has been made superintendent of the Delaware division, eastern region, vice Mr. Sheaffer.

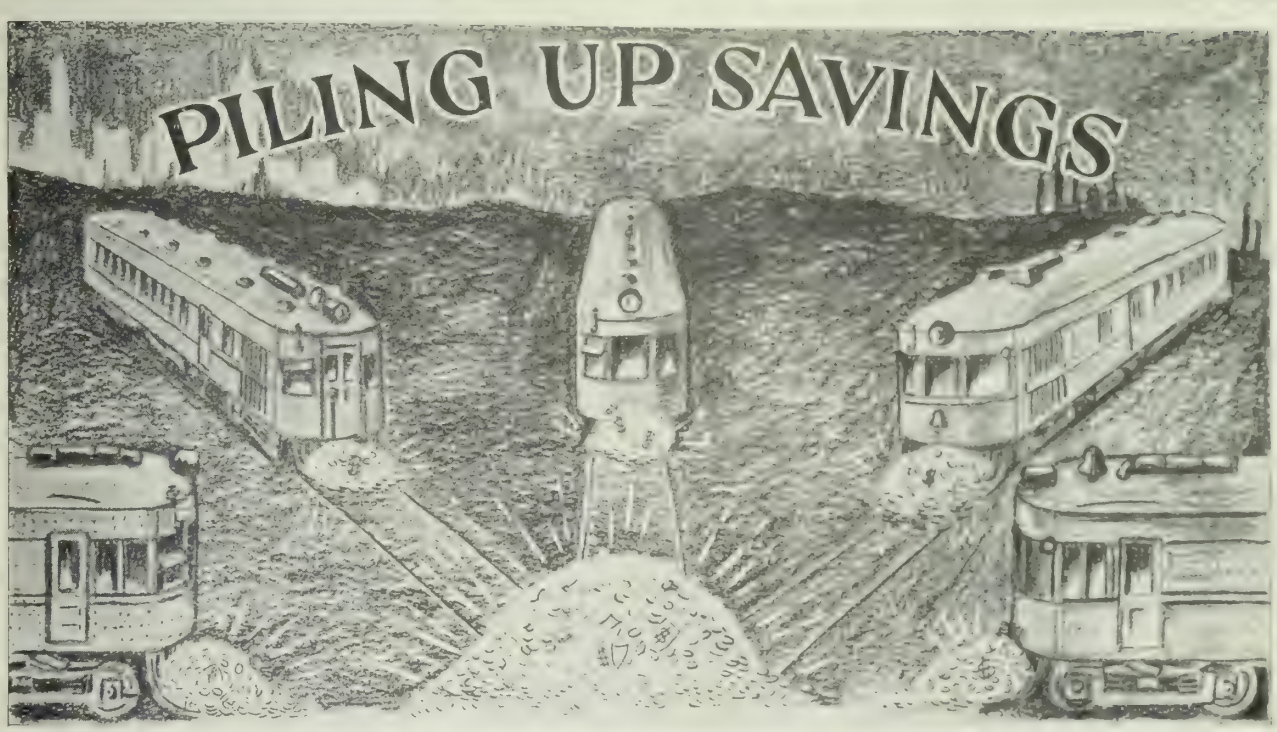
F. Q. Treadway

The Great Northern announces that **H. E. Jones**, assistant superintendent of the St. Cloud division, with headquarters at Minneapolis, has been named superintendent of that division, to succeed **F. D. Kelsey**, who has been transferred to the Mesabi division with headquarters at Superior, Wis.

R. E. Kelly of San Francisco has been appointed manager of a new department of the Southern Pacific to be known as the department of development and colonization, the purpose of which is to aid in the development of agriculture through territories served by the Pacific lines. **Edward H. Sharpe** and **F. Q. Treadway** have been appointed assistant managers; **George W. Barr**, agricultural agent, and **Erich F. Stuewe** agricultural editor. The department plans to work with and through existing agencies such as farm bureaus, agricultural colleges and civic organizations.

"We shall work with such agencies and others," says Mr. Kelly, "to meet the marketing problems of the farmers, and the standardization of their products; aid the irrigation districts in getting a sound policy for development, and preach constantly the gospel of honest representation to new-comers of the possibilities of lands on which they will settle."

Edward H. Sharpe



with Westinghouse Equipped Gas-Electric Rail Cars

On 26 Railroads

Alaskan
Baltimore & Ohio
Big Four
Boston & Maine
Central Vermont
Chicago, Burlington & Quincy
Chicago, Milwaukee & St. Paul
Chicago Northwestern
Detroit, Toledo & Ironton
East Broad Top
Erie
Great Northern
Lehigh & New England
Lehigh Valley
Manitoba Power
New York Central
New York, New Haven & Hartford
New York, Ontario & Western
Pennsylvania
Reading
Richmond, Fredericksburg & Potomac
St. Louis & San Francisco
Santa Fe
Seaboard Air Line
Temiskaming & Northern Ontario
Wheeling & Lake Erie

IN quest for greater operating efficiency, 26 railroads in 24 states, and in Alaska and in Canada, have replaced steam operated trains with Westinghouse equipped gas-electric rail cars as the economical solution of the lean branch line traffic problem.

Because of the various operating economies made possible by these efficient "tools" of transportation, practically all of these roads have been able to show remarkable savings in operation over steam equipment. Traffic, also, has been stimulated by the more attractive accommodations than are afforded by the rolling stock usually assigned to branch line service. Records of specific cases are available to railroad executives, upon request.

Westinghouse electrical equipment has been installed on gas-electric cars built by all car builders in this field. These installations include single, double and triple power plant units of Westinghouse equipment used with every type of gasoline engine now available for this class of service.

Remember to inspect the Westinghouse equipped gas-electric rail cars in Atlantic City, June 20-27.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

Westinghouse

X97130

F. W. Leamy

Mr. Kelly will continue to handle public relations and to direct the bureau of news which is a part of the new department.

John Bose, superintendent of the New Orleans and Mobile division, Louisville & Nashville, has been named director of personnel, with headquarters at Louisville and will be succeeded as division superintendent with headquarters at New Orleans, by **L. L. Morton,** special engineer.

L. K. Marr, superintendent of the Atlantic and Camden Terminal divisions of the Pennsylvania, with headquarters at Camden, N. J., has been appointed assistant to the general superintendent of the New Jersey division, with headquarters in New York. Mr. Marr is succeeded by **J. F. Henry,** now passenger trainmaster, Philadelphia Terminal division.

C. M. Levey and **Campbell McGregor** have retired as directors of the Western Pacific and are succeeded by **Scott F. Ennis,** president, Pacific Fruit Exchange and **E. W. Mason,** vice president and general manager of the Western Pacific.

The Oregon-Washington R.R. & Navigation Co. announces that **John C. Albright,** chief clerk to the general manager at Portland, has been named assistant superintendent of the first division with headquarters at the same point. Mr. Albright succeeds **J. F. Corbett,** transferred. **A. G. Kamm,** assistant superintendent on the third division, with headquarters at Walla Walla, has retired and will be succeeded by **H. B. Coburn,** assistant superintendent on the second division, with headquarters at La Grande, Ore. **R. O. Cowling,** assistant superintendent, second division, with headquarters at Spokane, will succeed Mr. Coburn at La Grande.

W. R. Martin, superintendent of the El Paso passenger station of the Southern Pacific, has retired from active service.

The Baltimore & Eastern and the Baltimore & Virginia Steamboat Co., announce these appointments: **C. S. Krick,** vice president of the eastern region of the Pennsylvania, with headquarters at Philadelphia, has been also elected president; **M. W. Clement,** operating vice president of the Pennsylvania has been elected vice president; **E. W. Smith,** general manager of the eastern region of the Pennsylvania, has been appointed general manager; **W. M. Wardrop,** general superintendent on the Pennsylvania, has been appointed general superintendent, with headquarters at Wilmington; and **J. G. Shaeffer,** division superintendent of the Pennsylvania at Wilmington, has been appointed superintendent.

W. L. Barnes, general superintendent of transportation of the Burlington, has retired after 55 years' service. **J. C. Roth,** general inspector of transportation, with headquarters at Chicago, has been appointed superintendent of transportation with headquarters at the same point. **L. C. Twyman** has been appointed assistant superintendent of transportation with headquarters at Chicago.

W. J. Yearsley, assistant superintendent of terminals on the Canadian National at Toronto has been appointed superintendent of terminals with headquarters at the same point.

The Southern Pacific in Texas and Louisiana announces that the position of acting superintendent of terminals at New Orleans has been abolished, and **J. H. Eddy** has been appointed superintendent of terminals at New Orleans vice **P. B. Torian,** deceased.

H. A. Broadbent, assistant general yardmaster of the Canadian National at Toronto, has been appointed assistant superintendent of terminals with the same headquarters.

F. W. Leamy, formerly assistant to the president and assistant secretary of the Delaware & Hudson, with headquarters at New York City, has been elected vice president to succeed William H. Williams, resigned. **H. M. Irwin,** assistant to the comptroller, has been appointed assistant to the president succeeding Mr. Leamy.

Financial and Legal

F. W. Charske has retired as controller of the Union Pacific but remains vice chairman of the finance committee. He will be succeeded as controller by **L. J. Tracey,** assistant controller with headquarters at New York.

Elmer Hart, assistant controller of the Pennsylvania with headquarters at Philadelphia has been elected also assistant controller of the Baltimore & Eastern and the Baltimore & Virginia Steamboat Co.

Thomas H. B. McKnight, treasurer of various companies in the Pennsylvania system has been elected vice president of the Pittsburgh, Cincinnati, Chicago & St. Louis and the Pennsylvania. Mr. McKnight entered the service of the Pennsylvania in 1877 as a messenger. He has served in various capacities in the treasury department, being appointed treasurer of companies composing the lines west of Pittsburgh in 1891 and treasurer of the system in March 1920.

Purchases and Stores

Edwin Meyer, assistant general storekeeper, of the Louisville & Nashville, with headquarters at Louisville, has been appointed general storekeeper to succeed **George W. Conway,** retired after 64 years' service. Mr. Meyer will be succeeded as assistant by **E. M. Atkins,** chief clerk.

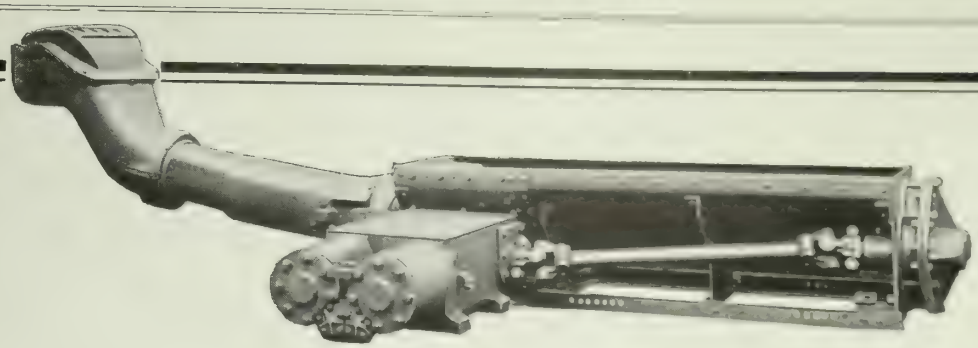
Montgomery Smith, assistant to the general purchasing agent of the Pennsylvania with headquarters at Philadelphia, has been appointed assistant general purchasing agent.

George T. Richards, district storekeeper of the Milwaukee, with headquarters at Minneapolis, has resigned to enter other business.

Traffic

W. A. Westington, freight terminal agent for the Southern Pacific at San

Thomas H. B. McKnight



The B—K Stoker

THE fact that the capacity of even relatively small locomotives can be materially increased by the addition of mechanical stokers has been established beyond question.

Perhaps one reason for withholding the application of stokers to the larger hand fired engines was because until recently no stoker of just the design to meet all requirements had been developed.

This need has now been met in the B-K Stoker, which can be applied to any type of locomotive without any material change in cab fittings, boiler, grates, etc.

Can we send you literature and other data covering?

The Standard Stoker Company, Inc.

New York Chicago Erie Pittsburgh

Francisco, has been appointed general industrial agent for the Pacific lines with headquarters at San Francisco to succeed **W. P. Ballard**, deceased.

The Reading announces these appointments: **Harry C. Stauffer**, freight traffic manager with headquarters at Philadelphia has been made general freight traffic manager with headquarters at the same point; **John W. Hewett**, assistant freight traffic manager will succeed Mr. Stauffer as freight traffic manager, and will be succeeded as assistant by **William B. Gheen**, general freight agent. **L. R. Jones**, assistant general freight agent, with headquarters at Philadelphia, has been made general freight agent. **R. D. Heusner**, coal freight agent, has been named general coal freight agent with headquarters at Philadelphia to succeed **C. C. Rambo**, retired. **Harry B. Light**, general agent in New York City will succeed Mr. Heusner as coal freight agent. **D. Y. Smith** will succeed Mr. Light at New York City. **H. H. Bauer** has been appointed assistant general agent. **Barton M. Croll**, division freight agent, has been appointed assistant general freight agent, and the position of division freight agent has been abolished. **Joseph A. Fisher**, foreign freight agent, has been appointed assistant general freight agent and will be succeeded as foreign agent by **Howard Albright**, general agent at Detroit. **James C. Beene**, general agent at Cincinnati, has been appointed general agent at Detroit to succeed Mr. Albright and will be succeeded at Cincinnati by **Herbert H. Clatur.**

R. E. Buchanan, executive general agent of the Frisco with headquarters at Memphis, has been appointed assistant traffic manager of the Pensacola division with headquarters at Pensacola, and will be succeeded at Memphis by **D. F. McDonough**, division freight agent at Birmingham.

Mechanical

J. L. Cunningham, superintendent of motive power of the western Pennsylvania division of the Pennsylvania, with headquarters at Pittsburgh has been appointed assistant to the general superintendent of motive power, central region. Mr. Cunningham will be succeeded at Pittsburgh by **R. H. Flinn**, superintendent of motive power, northern division, with headquarters at Buffalo. **M. R. Reed**, master mechanic at Fort Wayne, Ind. will succeed Mr. Flinn as superintendent of motive power, northern division. **W. L. Scott**, road foreman of engines of the recently abolished Richmond division of the Pennsylvania, has been appointed mechanical inspector, western region

Civil

C. L. Cansler has been appointed track supervisor of the Southern, with territory from Stevenson to Decatur, Ala., headquarters at Huntsville, to succeed **A. Williams. J. S. Wearn** has been appointed track supervisor, with territory from Knoxville to Cumberland Gap, headquarters at Knoxville, to succeed **W. H. Wood**, who has been transferred to the territory from Bristol, Tenn., to Bulls Gap, headquarters at Johnson City. Mr. Wood succeeds **J. W. Price**, deceased.

J. C. White, division engineer of the Pennsylvania Railroad, Richmond Division, recently abolished, has been appointed division engineer of the Logansport division vice **D. B. Johnston**, transferred to assistant engineer maintenance of way, western region. **F. A. Cellar**, assistant to the division engineer, Richmond division, has been transferred to the Cincinnati division vice Mr. Coburn, transferred. **O. K. Boles**, supervisor of telegraph and signals on the Richmond division, has been transferred to assistant supervisor telegraph and signals on the Cincinnati division.

C. A. Taylor, signal engineer on the Chesapeake & Ohio, with headquarters

JORDAN SPREADER
"Does the Work of an Army of Men"
SNOW PLOW ICE CUTTER DITCHER
UNIVERSALLY STANDARD
O.F. JORDAN COMPANY
WALTER J. RILEY, PRESIDENT
EAST CHICAGO, INDIANA

JORDAN
SPREADER - DITCHER

Indispensable in mines, on railways, public works, industrial plants, etc.

Built in Standard and Narrow Gauge Sizes

RALSTON BUILT

See This Car At the A. R. A. Convention, Atlantic City

70-Ton Hopper Car Embodying Unusual and Novel Features Built For The Wine Railway Appliance Company

By

THE RALSTON STEEL CAR COMPANY

COLUMBUS, OHIO

Builders of Freight Cars for a Quarter of a Century

at Richmond, has been appointed superintendent telegraph and signals with headquarters at the same point. The position of superintendent of telegraph, held by J. A. Gleason, deceased, is abolished.

The Chicago & Illinois Midland has appointed **C. A. Hopkins** valuation engineer with headquarters at Springfield, Illinois.

The Katy announces that **R. W. Adams,** has been appointed telephone engineer, with headquarters at Denison, Tex., to succeed **R. A. Hendrie,** resigned.

J. H. Schubert, general signal inspector of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, has been appointed signal engineer to succeed **G. S. Pflasterer,** resigned.

Obituary

John Mitchell Johnson, formerly vice president of the Denver & Rio Grande Western, died June 5 at Palo Alto, Calif., aged 83.

S. E. Howell, passenger agent of the Nashville, Chattanooga & St. Louis at Chattanooga died May 8 at his home there, aged 73.

A. K. Stone, former safety supervisor of the New York region of the Erie, died at Minneapolis May 13.

Paul T. Brady

Alexander Kearney. A Picture Taken Ten Days Before the Accident.

Pinkney B. Torian, superintendent of the New Orleans terminals of the Southern Pacific in Louisiana and Texas died in that city May 12.

Seymoure P. Laing, who was fireman on the first train over the Central Pacific from the East to meet the one from the West for the ceremony of driving the golden spike at Promontory, Utah. in 1869, died in Sacramento, May 28, aged 85. Mr. Laing was a pioneer of Nebraska and an associate of Buffalo Bill Cody.

Paul T. Brady, special representative of the Westinghouse Electric & Mfg. Co., with headquarters at New York, died May 3 in Portland, Ore., aged 71. Mr. Brady had been associated with the Westinghouse Co. for 34 years and actively engaged in the electrical industry since 1881.

Robert E. Parson, chief engineer of the Erie, with headquarters at New York, died May 18, aged 55. Mr. Parson entered the service of the Erie in 1895 and, except for a few years as division engineer of the New York, Susquehanna & Western, was with the road until the time of his death.

Alexander Kearney, superintendent of motive power of the Norfolk & Western, died May 20 at Roanoke, Va., aged 59, from injuries received when he was thrown from his horse the day before. Mr. Kearney entered railway service with the Pennsylvania in 1888 as special apprentice at the Altoona shops. He was with this road until 1902 when he was appointed superintendent of motive power of the Baltimore & Ohio lines west of the Ohio River. In 1905 he was appointed assistant superintendent of motive power on the Norfolk & Western and in 1918 was appointed to the position he held at the time of his death.

Paul Didier, principal assistant engineer of the Baltimore & Ohio, with headquarters at Pittsburgh, died there May 19, having been in the service of that road nearly 48 years.

Ottis Parsons, district sales manager of the American Locomotive Co., New York district, died at his home in New York, April 16, aged 60.

Supply Trade Notes

The **Cincinnati Car Co.** has appointed **H. R. Sykes** manager of sales of the locomotive division.

Ross F. Hayes, New York, has been appointed general sales agent at New York for the **Hastings Signal & Equipment Co.,** Boston.

The **American Brown Boveri Electric Corpn.,** Camden, N. J. has appointed **E. J. Blake** engineer in charge of the car lighting section.

J. E. Heber has been appointed vice president in charge of the Pacific Coast territory with headquarters at Los Angeles, of the **Truscon Steel Co.**

The **Forsyth Draft Gear Corpn.** has appointed **Joseph S. King, Jr.** sales representative with headquarters at Chicago. Mr. King was formerly engineer of tests of the Bradford Corpn.

At Atlantic City this year **John G. Platt,** who has been attending the M. M. and M. C. B. conventions for many years and who is well known to all of the old timers as well as the younger railroad men, will appear with a new title. As was announced in the April issue of Transportation he was recently elected president and general manager of the Hunt-Spiller Mfg. Corpn. of Bos-

Super-Power Principles

A Super-Power Locomotive is one which produces maximum power for a definite driving-wheel weight with minimum fuel and water consumption per unit of power.

High Boiler Capacity for maximum power output.

Large Firebox for low combustion rates, high fuel efficiency, and great power reserve.

Four-Wheel Articulated Trailing Truck to carry the large firebox, provide an adequate ashpan, prevent axle loads from becoming excessive, and to reduce rail stresses.

Limited Cut-Off and High Boiler Pressure for maximum cylinder horsepower output, smoother turning effort and, consequently, better utilization of driver weight and great economy in the use of steam.

All These Principles Have a Direct Bearing on the Reduction of Operating Expense—Every One Increases Gross Ton Miles Per Hour and Decreases Fuel Consumption

The Locomotive Booster to provide the power necessary to start and quickly accelerate the heavier trains that the Super-Power Locomotive can pull at higher speeds.

Type "E" Superheater and Feedwater Heater to provide maximum obtainable boiler capacity and highest fuel efficiency.

Superheated Steam for Auxiliaries to still further promote economy in steam and fuel.

Tandem Main Rod Drive to take care of the higher power output of the Super-Power Locomotive and to reduce rod, pin and driving box maintenance.

The successful application of these principles to every-day railroad practice is demonstrated by their use on hundreds of locomotives.

LIMA LOCOMOTIVE WORKS
Incorporated

CONLEY

Solid Manganese

Self Guarded

SPRING FROGS

SHOWING SPRING FROG IN SERVICE

Are giving excellent service under severe traffic conditions on Railroads using them.

Twenty years successful service by CONLEY TYPE FROGS have demonstrated their merit for safe and economical service.

CONLEY FROG & SWITCH CO.

Memphis, Tenn.

John G. Platt

ton following the death of Walter B. Leach. John started in the railroad game in 1874 as a messenger for the Baltimore & Ohio and grew up through the drafting room and mechanical department of that road. In 1907 he left railroad service to become master mechanic of the Franklin branch of the American Steel Foundry, and in June of that year he became mechanical representative of the Hunt-Spiller company.

There probably are few men in the railway supply business who enjoy a wider acquaintance than Mr. Platt, and his host of friends in the railway game only hope that John's new duties won't keep him from getting around frequently so that he can always carry out his favorite piece which goes:

There's a long long winding road
that never wearies me.
A road I often travel when old
friends I wish to see.
That road is called "Sweet Memory," so old, yet ever new,
And I oft in fancy wander there, to
laugh and talk with you.

Robert D. Sinclair has been elected president of the new **Fairmont Railway Motors, Inc.** formed June 1 by the merging of the Fairmont Railway Motors, Inc., Fairmont, Minn. and **Mudge & Co.**, Chicago. Other officers elected are; **H. E. Wade**, chairman of the board; **J. P. Dunning**, vice chairman of the board; **W. F. Kasper**, vice president; **Albert C. Force**, vice president; **H. M. Starrett**, treasurer, and **A. R. Fancher**, secretary. General offices will be maintained at Fairmont and general sales offices in the Railway Exchange Bldg., Chicago. The Fairmont Railway Motors, Inc. will continue to manufacture both Fairmont and Mudge cars and equipment, and operate both manufacturing plants, one at Fairmont and one at Chicago.

Charles E. Tullar, assistant manager of the patent department of the **General Electric Co.**, has been appointed manager of the department, succeeding **A. D. Lunt**, deceased.

William W. Neckerman has been appointed general manager of the **Republic Iron & Steel Co. W. J. Mossman**, in the Chicago office of the Sheet & Tube, has been named purchasing agent, succeeding **Sidney H. Hedges. H. D. Rhodehouse**, formerly traffic manager of Youngstown Chamber of Commerce, has been appointed traffic manager.

H. S. Brautigam, formerly assistant to the master car builder of the Milwaukee, has been appointed southwest district representative with headquarters at St. Louis of the **Allegheny Steel Co.**, Brackenridge, Pa.

J. L. Terry, for many years in charge of the southwestern territory of the **Q. & C. Co.**, with headquarters at St. Louis, has been elected vice president in charge of sales with headquarters in Chicago.

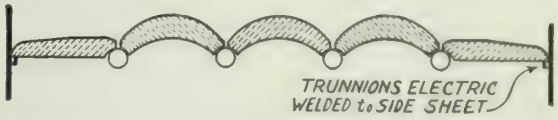
The general offices of **The Hutchins Car Roofing Co.**, Detroit, has been moved from 1203 Ford Bldg., to 2310 Eaton Tower.

W. J. Fendner has been appointed mechanical engineer of the **Schaefer Equipment Co.**, Pittsburgh. Mr. Fendner had been in the engineering department of the **Clark Car Co.** since 1914, his work there being in connection with car design and development.

The **Continental Brake Shoe & Equipment Co.** announces the removal of its general offices from 200 Fifth ave. to Room 2710, Grand Central Terminal, New York.

W. J. Fendner

Economy Baffle Walls
for
Steam Locomotives



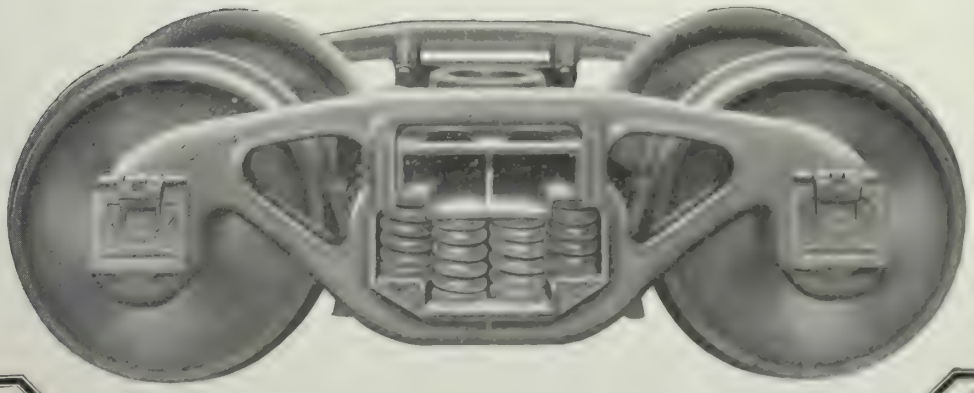
"ECONOMY" method—

1. Eliminates liability of side brick dropping into fire bed.
2. Insures maximum life of brick with minimum weight on arch tubes.
3. Eliminates the necessity of straightening or replacing bent arch tubes, due to wedging effect.
4. Closes the "pockets" between brick and side sheets, where slag and "honey-comb" accumulate, thus increasing the active firebox heating surface.
5. Provides radiant heat for more complete combustion near side sheets.

ECONOMY ARCH COMPANY

1843 RAILWAY EXCHANGE BUILDING ST. LOUIS, MISSOURI

DALMAN TRUCKS



BOOTHS
149 - 151

ASF

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

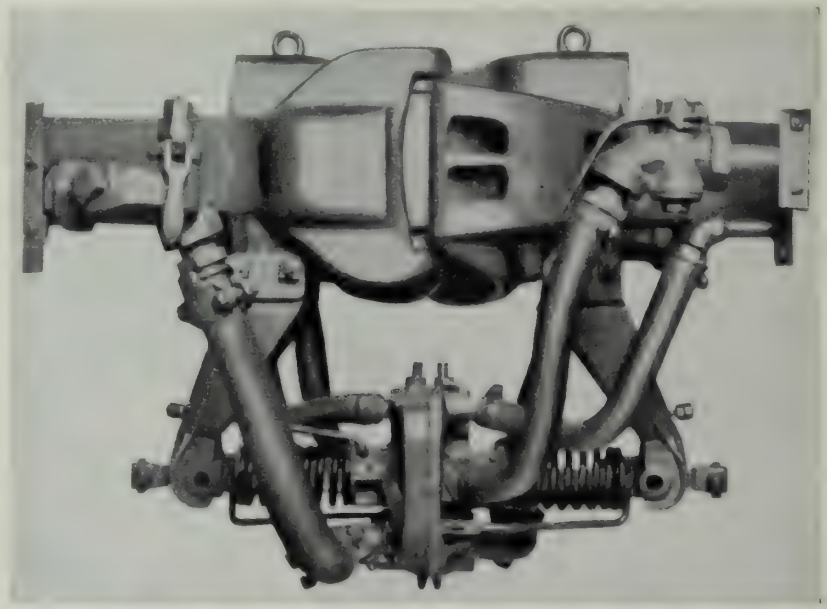
Why Connectors Are Needed

Because of the investigations now being conducted by the A. R. A. and the I. C. C. many officials in mechanical departments are showing considerable interest in the subject of automatic connectors. It is interesting to know that at present there are more than 3,000 American connectors in use. When they start out on the summer's trips this year all the cars of the John Robinson Circus and the Sells-Floto Circus will be equipped with the latest type of American connectors. Most of the cars of the ore railroads in the upper Michigan peninsula are equipped with this type of connector.

Many railroad men are inclined to look upon the connector purely as a safety device but in reality its economic value is just as important when one realizes that the average life of the ordinary air brake hose is only from eight to ten months, whereas the life of the hose on cars equipped with automatic connectors is from four to five years, partly because the flexing of the hose is avoided in making connections and because there is no 1600-pound pull on the hose when a connection is broken.

In addition to the saving on hose it is estimated that from 45 minutes to an hour is saved for the engine and the crew in connecting up an average train of from 50 to 60 cars, and as the connector joint between the cars does not move, leakage in the air line is reduced 25 to 50 per cent with a considerable saving in fuel.

In the present American design all bends and elbows found in regular air lines are eliminated, this allowing a free flow of air which saves from one-fourth to one-third of the time usually necessary to set the brakes. The American connector is a product of the Consolidated Connector Corpn. of Cleveland, Ohio.

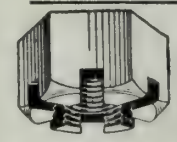


The American Connector Made by the Consolidated Connector Corpn.

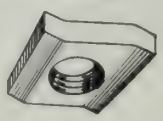
"This up-side-downness is at the request of the Advertiser: "Nuts is Nuts"

COLUMBIA NUT & BOLT CO., Inc.
BRIDGEPORT, CONN.

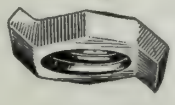
ALSO U. S. S. SEMI-FINISHED AND U. S. S. SLOTTED NUTS



COLUMBIA "GIB" NUTLOCKS



Square



Hexagon

A "SAFETY" NUT LOCK

Apply with fingers till holding nut is met—then wrench. Note time saved—material saved—money saved—PIECE WORKERS like them.

COLUMBIA LOCK NUTS

A "SELF-LOCKING-NUT"

Standard sizes and dimensions. Easily applied without waste of time or injury to threads. CANNOT shake loose. FREIGHT CARS all over the country have them on. They have stood the test of years.

"Ask for a copy of the 'Bughouse Bugle' our newspaper."

SPECIALISTS IN FORGED

Center Plates
Draw Bar Yokes
Knuckle Pins
Air Brake Pins
Brake Jaws
Journal Box Wedges
and
Miscellaneous Forgings

Send us your specifications

Steel Car Forge Company

Pittsburgh New York Chicago Baltimore

EXTENSION SIDE DUMP CAR

The load and moving parts of the car are balanced throughout dumping operation.

For detailed description see Car Builders Cyclopedia

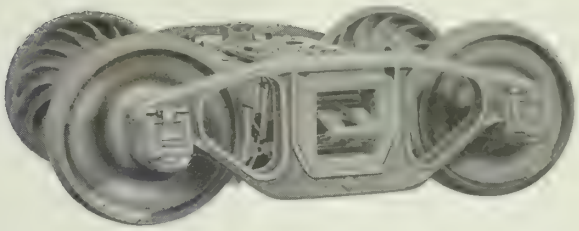
CLARK CAR COMPANY
BALANCED DOOR DUMP CAR
PITTSBURGH, PA.

San Francisco, Rialto Building — Minneapolis, Sexton Bldg. — Richmond, Va., Travelers Bldg.
Chicago, 557 Ry. Ex. Bldg. — New York, 52 Vanderbilt Ave. — Boston, 683 Atlantic Ave.

ON DISPLAY AT ATLANTIC CITY

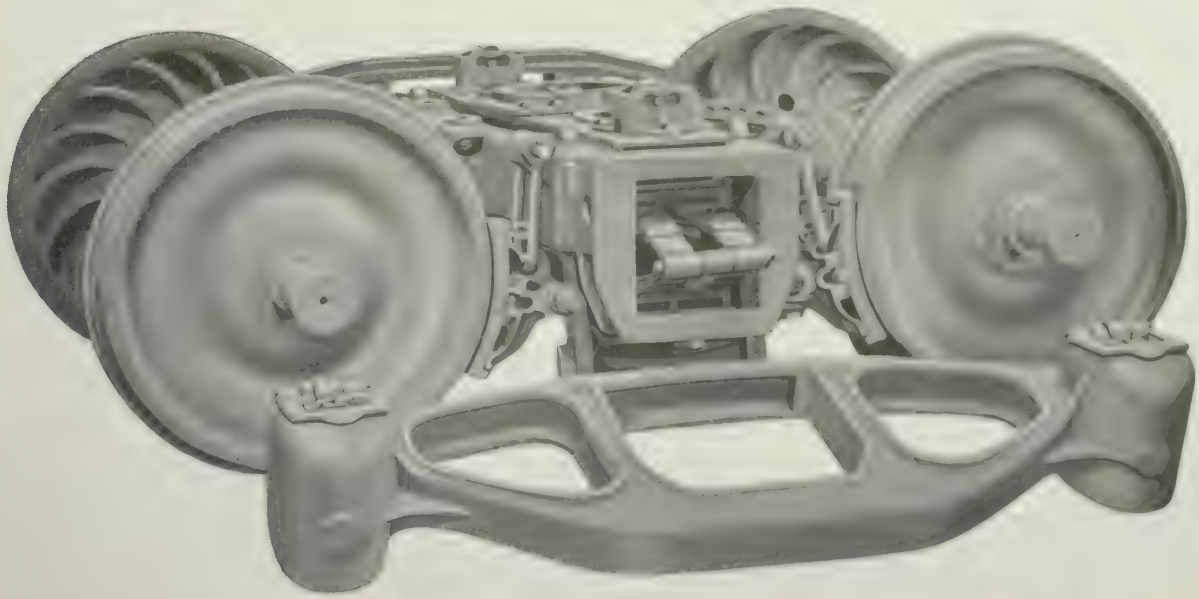
The BETTENDORF

Swing Motion Caboose Car Truck with Cast Steel Transoms



Another BETTENDORF Improvement

THERE are, already, approximately 6000 caboose cars equipped with Bettendorf Swing Motion Caboose Car Trucks. We are now offering these same caboose car trucks with cast steel transoms; a valuable feature which adds strength and reduces the number of parts without increasing the weight or cost. It will be a pleasure to supply detailed information concerning these, the finest of caboose trucks.



THE BETTENDORF COMPANY

OFFICES AND WORKS BETTENDORF, IOWA

Transportation

The Monthly Magazine of the Transportation Industry

A BALKING HORSE
CANNOT BE CURED

In other respects he may be the best horse in the team but he is undependable. No one can predict when he will balk, so his weakness must be considered in every load.

A SLIPPING ENGINE
CAN BE CURED

The best power unit on the road is helpless without traction. Don't load for a "bad rail." Instead, cure the slipping engine by equipping it with GRAHAM-WHITE SANDERS. They are *automatically* self-cleaning and *insure* traction regardless of weather or rail conditions. Use them and load to capacity at all times.

SEE OUR EXHIBIT
AT BOOTHS 542 & 544
IN THE ANNEX
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JUNE 20-27

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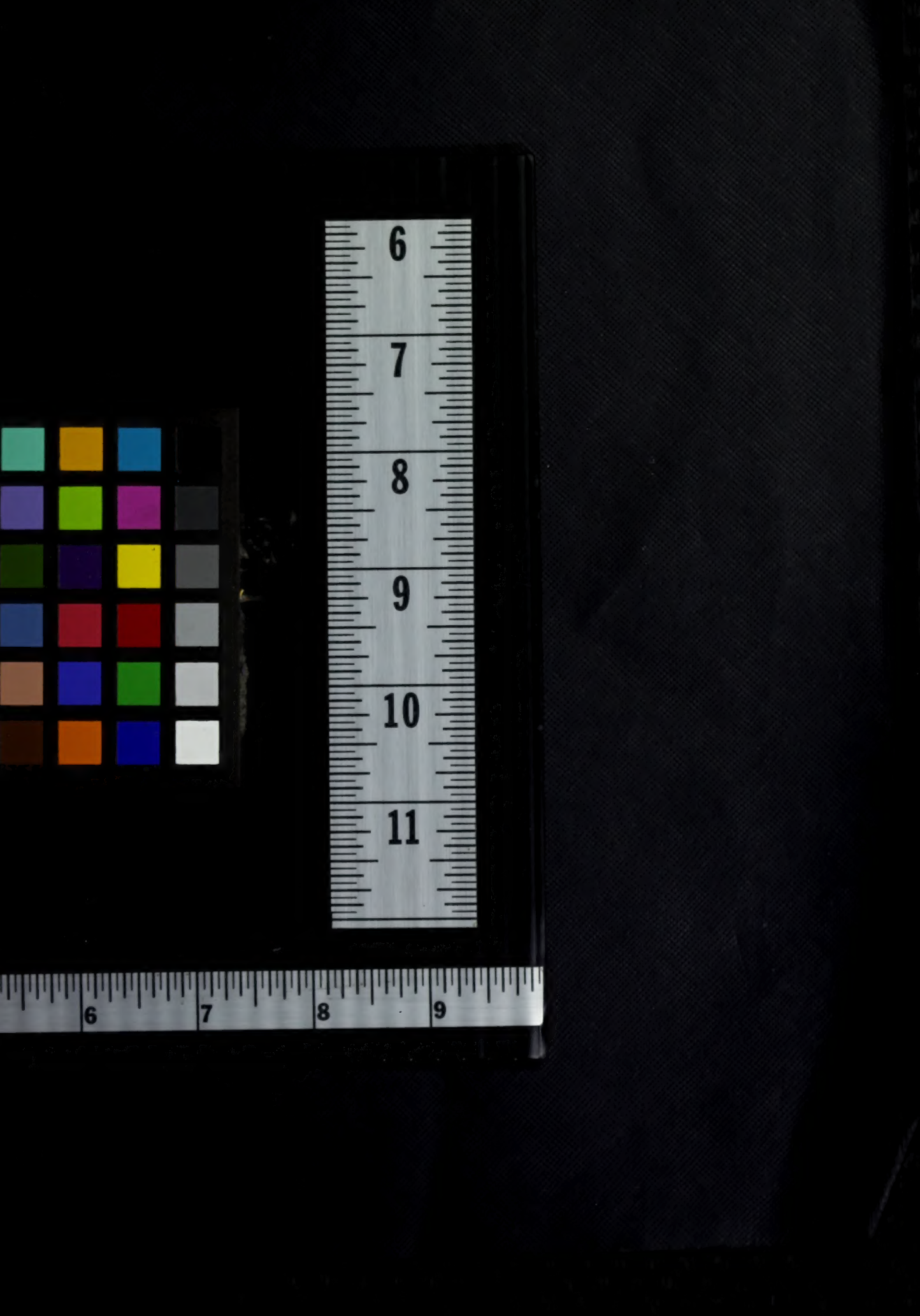
New York

GRAHAM-WHITE SANDERS